OPERATOR'S MANUAL

FOR

50 CM-WIDE SINGLEFOLD INTERFOLDER

SERIAL NUMBER 5285-96 PZ3

TWO HEAVY DUTY DRIVEN UNWIND STANDS

SERIAL NUMBER 5286-96 PZ3

TWO HEAVY DUTY TURRET STANDS

SERIAL NUMBER 5287-96 PZ3

FOUR-STATION PRESS TABLE

SERIAL NUMBER 5288-96 PZ3

IT IS THE INTENT OF THE C. G. BRETTING MFG. CO. INC., THAT
THIS OPERATOR'S MANUAL SHALL BE USED AND VIEWED BY
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BRETTING

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Chapter 1 Safety

Section A

Machine Safety

General Safety Information - Operator

All service and maintenance work should be performed by qualified service personnel.

All employees must read and understand the following safety instructions and make them a daily practice. Maintenance personnel and the operator must know these instructions along with their company's safety program in order to prevent personal injury and property damage.

Maintenance and Servicing Equipment Shutdown Procedures

To perform maintenance or service on the machine, do the following:

1) Notify all affected employees the machine or equipment will be shut down to perform service or maintenance.
2) The authorized employee must:
   A) Refer to the company procedure to identify the type and magnitude of energy the machine or equipment uses.
   B) Understand the hazards of the energy.
   C) Know the methods to control the energy.
3) If the machine or equipment is running, shut it down by following the "Normal Machine Shutdown" procedure (Press the *Stop* button, open switch, close valve, etc.).
4) De-activate the energy isolating device(s) so the machine or equipment is isolated from the energy source(s).
5) Lock out the energy isolating device(s); that is, the main air or electrical disconnects, with the assigned individual lock(s).
6) Drain away, exhaust, or restrain stored or residual (leftover) energy (for example, elevated machine members, hydraulic systems, or air pressure, etc.) with grounding, repositioning, blocking, bleeding down, etc.
7) Be sure the equipment is disconnected from the energy source(s).
8) Verify the isolation of the equipment by operating the push button, other normal operating controls, or by testing to make certain the equipment does not operate.
   Note: Before verifying the isolation of the equipment, make sure no personnel, tools, or hardware are exposed to the machine or equipment.

Caution!
Return the operating controls to neutral or the *Off* position after verifying the isolation of the equipment.

The machine or equipment is now *locked out*.

Restoring Equipment To Service Procedures

When the service or maintenance is completed and the machine or equipment is ready to operate, perform the following steps:

1) Check the machine or equipment and the immediate area around the machine to ensure all non-essential items have been removed and the machine or equipment components are operationally intact.
2) Check the work area to ensure all of the employees are safely positioned or away from the area.
3) Verify that the controls are in neutral.
4) Remove the *lockout/tagout* devices and re-energize the machine or equipment.

Note: The removal of some forms of blocking may require re-energizing of the machine before safe removal.

5) Notify the employees affected by the servicing or maintenance that the servicing or maintenance is completed and the machine or equipment is ready for use.

General Safety

1) **Do not** operate, maintain, or repair a machine when taking any kind of drug or sedative, after the consumption of any alcohol, or when fatigued.
2) **Do not** wear any loose clothing or jewelry that could get caught in moving parts.
3) **Do not** let your hair hang. It could impair vision or become caught in the machine.
4) Wear non-slip soled shoes.
5) **Do not** listen to radios or wear headphones at the machine. The machines produce sounds which have specific tonal qualities the operator should listen for. Understand the different tones while the machine is running; certain tones could indicate possible trouble. Early detection of trouble could prevent damage to the machine or injuries to the operator.
6) Keep the floors around the machine free of obstructions and liquids.
7) Use handrails on the catwalks and steps of the machines.
8) Keep the catwalks clean and free from obstacles and obstructions. They can become slippery if liquids, grease, or dust are allowed to build-up.
9) All *accident prevention signs* must be followed to prevent injury and machine damage. **Do not** remove the signs. If a sign is missing or illegible, replace the sign immediately. **BRETTING** will provide **free** replacement signs. Contact customer service at 715-682-5231 for more details.
10) Be familiar with the machine you are operating. Know the locations of all the *Stop* buttons and main air shut-off valves.
11) Perform maintenance and adjustments only if you are trained to do them. All other machine service should be performed by trained and qualified electrical/service personnel.
12) **Do not reach into a running machine for any reason!** Operators must not place any part of their body near an area where components of the machine move, rotate, or nip together or where any possibility of injury exists (such as gears, roll bodies, belt and sheaves, etc.).

DANGER!
THREADING A MACHINE IS *HAZARDOUS.* IT CAN RESULT IN *SERIOUS INJURY OR DEATH.* PRECAUTIONS MUST BE TAKEN.

13) To clear a jam, refer to your company *lock out* or *tag out* procedure.
14) Use **Caution** when operating a hoist to load the parent rolls. **Do not** leave parent rolls hanging unattended in the hoist. Keep the hoist clear of the machine when not in use. Do not exceed the load capacity.
15) Make sure all of the electrical, pneumatic, and hydraulic power is disconnected per your company's lockout/tagout procedures before climbing on, over, or under the machine.
16) Use **Caution** when using air hoses and when working around any high air pressure couplings. Follow the manufacturer's procedures and warnings.

17) Use **Caution** when working on or around pneumatic cylinders and the related proximity switches.

18) Wear appropriate personal protective equipment when handling cleaning solvents. Refer to the substances material safety data sheet for proper safety information.

WARNING!
TRAINED ELECTRICAL PERSONNEL MUST MAKE SURE ALL OF THE ELECTRIC MOTORS AND ELECTRICAL WIRING ARE CORRECTLY INSTALLED. ALL OF THE CONNECTIONS MUST BE CHECKED BECAUSE ANY LOOSE WIRING CAN RESULT IN ELECTRICAL SHOCK.

19) Alert all personnel involved with the machine to be aware of automatic cycling features on units such as paddle conveyors, separators, wrappers, and cartoners. These can start without warning or can continue cycling after the folder has been shut down.

Machine Guarding

There are several ways BRETTING MANUFACTURING INC. engineers safety into its machinery. Fixed, interlocked, and adjustable guarding are the three most common guard styles applied to BRETTING equipment. Please read the guarding safety information which pertains to your equipment.

DANGER!
NEVER OPERATE A MACHINE WITH ANY GUARD OPEN, OUT OF PLACE, OR ALTERED. DO NOT OVERRIDE OR DISCONNECT ANY SAFTEY DEVICE. DOING SO COULD RESULT IN A FATALITY , SERIOUS ACCIDENT, OR CAUSE MACHINE DAMAGE.

Fixed Guarding

Fixed guards are those that are permanently fixed to the machine or to a structure around the machine. They can be constructed of metal and/or plastic. Fixed guards are welded or fastened with tooled fasteners (such as bolts) and/or tooled latches that require tools to operate. Fixed guards with tooled fasteners or latches provide protection for non-authorized personnel who have not been trained to remove guards while servicing the machine. Before servicing, see "Maintenence and Servicing Equipment Shutdown Procedures" section in the "General Safety Procedures." Make sure all of the guards are in place and secure prior to starting the machinery.

Interlocking Guarding

These guards may be constructed of metal and/or plastic. When this type of guard is opened or removed while the machine is in motion, the safety switch will send a message to the controller and the area in which the guard protects will come to a stop. If the machine is not in motion and the guard is opened or removed, the area that the guard protects will be mechanically isolated from motion until the guard is closed or replaced and a reset button is pressed. MAKE SURE THE PROTECTED AREA IS CLEAR OF PEOPLE AND TOOLS PRIOR TO RESETTING THE MACHINE. Check the safety switches on a daily basis to make sure they are operating properly.

Adjustable Guarding

These are guards that need to be adjusted to accomodate various machine operations. Guards must be adjusted to OSHA standards prior to operating the machinery.

Safety Devices

Photoelectric and two-handed controls are the two safety devices occasionally applied to BRETTING equipment. Please read the following safety information which may pertain to your equipment.

Photoelectric Presence-sensing Devices

Photoelectrical (optical) presence-sensing devices use a system of light sources and controls which will interrupt the machine's operating cycle if the light field is broken. If the machine is not in motion and the light field is broken, the area the photoelectric sensor is protecting will be mechanically isolated from motion until the photoelectric system is reset by pressing the reset button. MAKE SURE THE PROTECTED AREA IS CLEAR OF PEOPLE AND TOOLS PRIOR TO RESETTING PHOTOELECTRIC SAFETY DEVICES. Check the photoelectric sensors on a daily basis to make sure they are operating properly.

Two-Handed Controls

Two handed controls require constant, concurrent pressure by the operator to activate the machine. The operator should make sure he/she is clear of dangerous areas when activating the machine. ONLY THE OPERATOR WHO IS OPERATING THE TWO-HAND SWITCH SHOULD BE WITHIN THE GUARDED AREA.

If you have any questions about your machine, please contact C.G. BRETTING MANUFACTURING CO., INC. for assistance.

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Section B

Safety Labels

GEFAHR! HEISS	PELIGRO! CALIENTE	PERICOLO! CALDO	DANGER! CHAUD

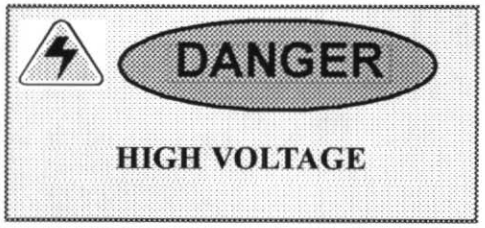
WARNUNG! AUF HAENDE UND FINGER ACHTEN	¡ADVERTENCIA! MANTENGA ALEJADOS MANOS Y DEDOS	AVVISO! ATTENZIONE A GLI MANE E DITA
ATTENTION! GARDE LES MAINS ET DOIGHTS	VARNING! ATTENTION!	

WARNUNG! SCHUTZVORRICHTUNGEN NICHT ENTFERNEN	¡ADVERTENCIA! MANTENGA LAS GUARDAS EN SU LUGAR	AVVISO! NON TOGLIERE LA COPERTURA
ATTENTION! TENIR LES PROTECTIONS EN PLACE	VARNING! LÅT ALLTID SKYDDEN SITTA PÅ SIN PLAT	WAARSCHUWING! VEILIGHEIDS - AFSCHERMING NIET VERWIJDEREN

CAUTION

DO NOT ADJUST VARIABLE SPEED DRIVE UNLESS MACHINE IS RUNNING

BEACHTEN! GESCHWINDIGKEITSGETRIEBE NUR EINSTELLEN WENN MASCHINE LAEUFT	CUIDADO! NO AJUSTE EL IMPULSO DE VELOCIDAD VARIABLE A MENOS QUE LA MAQUINA ESTE FUNCIONADO
AVVISO! NON AGGIUSTARE LA VELOCITA A MENO	PAS OP! SNELHEID ALLEEN REGELEN BIJ DRAAIENDE MACHINE
OBSERVERA!	ATTENZIONE!
AVERTISSEMENT!	ATTENTION!



GEFAHR! HOCHSPANNUNG	PELIGRO! ALTO VOLTAJE	PERICOLO! VOLTAGGIO ALTO

DANGER

MOVING MEMBER UNDER THIS GUARD KEEP HANDS AND FINGERS CLEAR

GEFAHR! BEWEGLICHE MASCHINENTEILE HINTER DER SCHUTZVORRICHTUNG-AUF HAENDE UND FINGER ACHTEN!	**PERICOLO!** MOVIMENTO DI PARTES SOTTO QUESTA COPERTURA - MANTENERE LA DISTANZA DI MANE E DITA
PELIGRO! LAS PARTES DEBAJO DE ESTA GUARDA ESTAN MOVIMIENTO MANTENGA ALEJADOS DEDOS Y MANOS	

WARNING

THIS MACHINE IS EQUIPPED WITH PROXIMITY SWITCHES WHICH MAY BE ACTIVATED BY TOOLS OR METAL PASSING NEAR OPERATING FACE.

WARNUNG! MASCHINE IST MIT SENSOREN AUSGERUESTET DIE DURCH NAHE LIEGENDE WERKZEUGE ODER METALL	**CUIDADO!** ESTA MAQUINA ESTA EQUIPADA CON INTERRUPTORES DE PROXIMIDAD, QUE PUEDEN SER ACTIVARSE CON HERRAMIENTAS O METALES
CAUTELA! QUESTA MACCHINA HA SENSORES DI PROSSIMITA CHE POSSONO ESSERE ATTIVATI DA ARNESE O METALLO MENTRE PASSANO VICINO IL FRONTE	**WAARSCHUWING!** DEZE MACHINE IS VOORZIEN VAN BENADERINGS - SCHAKELAARS DEZE KUNNEN GEAKTIVEERD WORDEN WANNEER GEREEDSCHAP OF METAAL IN DE BUURT VAN

ATTENZIONE!	ATTENTION!	OBSERVERA!

WARNING

DO NOT OPERATE WITHOUT GUARDS

WARNUNG! NICHT EINSCHALTEN WENN SCHUTZVORRICHTUNGEN	**CUIDADO!** NO SE OPERE SIN LAS GUARDAS DE PROTECCION	**AVVISO!** NON OPERARE SENSA COPERTURA	**ATTENTION!** NE PAS METTRE EN MARCHE SANS PROTECTIONS
VARNING! KÖR ALDRIG MASKINEN UTAN SKYDD			

CAUTION

KEEP OFF THIS IS NOT A WALKWAY

BEACHTEN! KEIN ZUTRITT DIES IST KEIN FUSSWEG	**¡CUIDADO!** MANTENGASE ALEJADO ESTE NO ES UN PASILLO	**ATTENZIONE!** TENER SI A DISTANZA QUESTA NON E' UNA PEDANA
AVVISO! REMANERE VIA - QUESTO NON E UNA PIATTAFORMA	**ATTENTION!** SE TENIR À DISTANCE CECI N'EST PAS UN PASSAGE CLOUTÉ	**OBSERVERA!** GÅ EJ HÄR DETTA ÄR INGEN GÅNGVÄG

DANGER

YELLOW WIRES OR WIRES WITH YELLOW MARKERS INDICATE A SEPARATE POWER SOURCE AND MAY HAVE POWER WITH THE DISCONNECT IN THE "OFF" POSITION

GEFAHR! GELBE LEITUNGEN ODER LEITUNGEN MIT GELBER FARBE HEISST GETRENNTE STROMLIEFERUNG-DIESE KOENNTE AKTIVIERT SEIN MIT DEM	**PELIGRO!** LOS CABLES AMARILLOS O CON MARCAS AMARILLAS INDICAN UNA FUENTE DE ELECTRICIDAD SEPARADA Y PUEDE HABER ENERGIA CON EL INTERRUPTOR EN LA POSION
PERICOLO! FILI GIALLI O FILI CON UN SEGNO GIALLO INDICANO UN FONTE DI ELETTRICITA SEPARATO E POSSONO AVERE POTENZA CON IL STACCATO IN	

CAUTION

NEVER ATTEMPT TO ENGAGE HANDWHEEL WHILE MACHINE IS RUNNING

BEACHTEN! NIEMALS VERSUCHEN MANUELL DAS RAD ZU DREHEN WENN DIE MASCHINE LAEUFT	**CUIDADO!** NO INTENTE CONECTAR EL VOLANTE DE MANO MIENTRAS LA MAQUINA ESTE FUNCIONANDO	**CAUTELA!** NON TENTARE DI OCCUPARE IL VOLANTE A MANO MENTRE LA MACCHINA STA ANDANDO

Chapter 2 Machine Configuration

Section A

Machine Profile

General Overview Of The Machine

Serial Number 5285-96 PZ3

The singlefolder line consists of two (2) driven unwind stands, turret stands, a roll loader, a dancer unit, an embossing unit, a web slitter, pull rolls, cutoff, transverse folding head to a tray where the product is removed manually and placed into the press table for banding.

The roll loader is used to load the parent rolls onto the turret stands.

The parent roll on the turret stand is unwound by the surface drive belt on the driven unwind stand.

The unwound web moves through the dancer unit located after the unwind stands. The dancer unit automatically controls the tension on each web.

The webs are then drawn together as they pass between the embossing rolls, which "imprints" the embossing pattern on them.

After embossing the webs are "slit" into two equal widths, with each width being the finished product width. The slitter process doubles the number of individual webs passing through the machine.

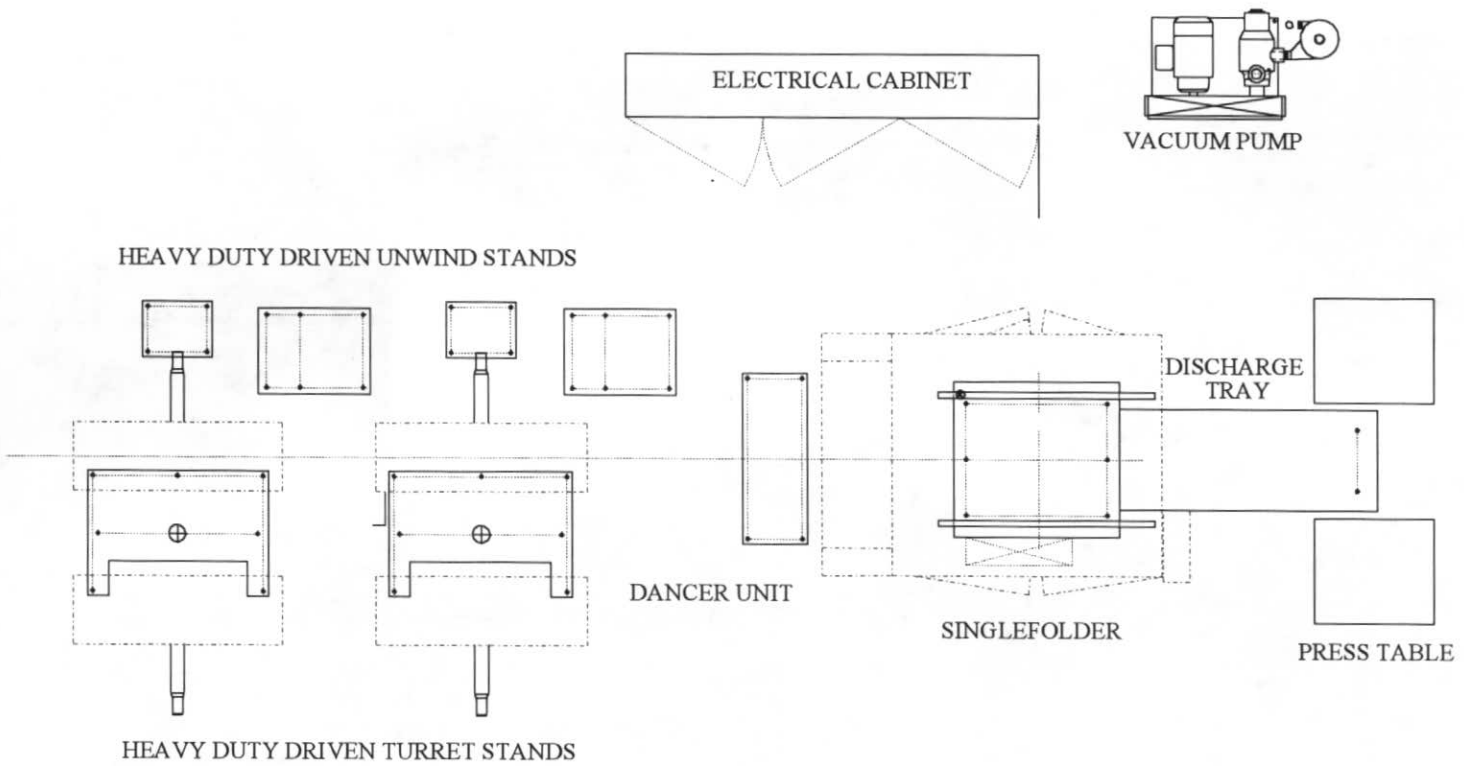
Pull rolls draw both webs into the singlefold folding head. One web is transported to the front section and the other is carried to the rear section of the singlefolder. Each section contains the same roll configuration and performs the same functions.

At the singlefold folding head, the two webs are individually cut to length, timed so one web overlaps the other and then are interfolded together by the folding rolls.

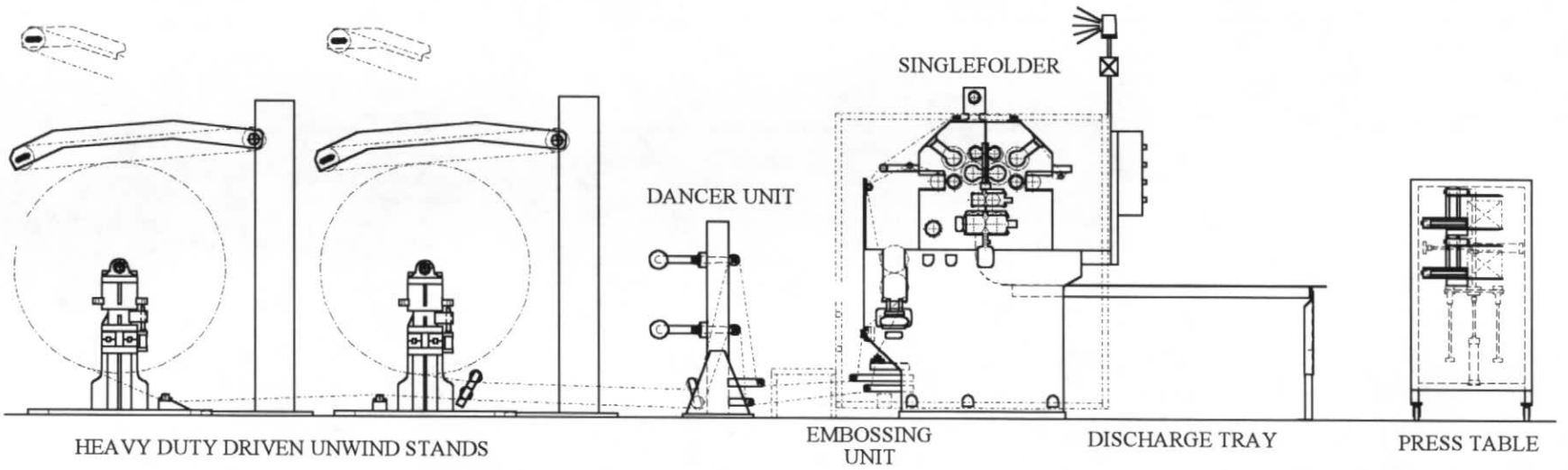
The interfolded sheets are packed off the folding rolls onto the discharge tray. A series of endless belting, along with several "Starwheels", help move the interfolded sheets away from the folding roll and also provide the necessary amount of back pressure to build a good quality pack.

A counting system keeps track of how many sheets are produced and actually creates a small tear in the sheets, indicating to the operator where the desired package count separation is.

Machine Floor Plan



Machine Elevation Drawing



Chapter 3 Machine Operation

Section A

General Procedures

Basic Start Up Procedure

The following start-up procedure, while not covering every possible detail, will serve as a basic guide.

1) PRE-START-UP CHECK OF MACHINE:
   A) Read and understand all **GENERAL SAFETY** Procedures.

WARNING!
NEVER OPERATE THE MACHINE WITH ANY GUARDS OFF OR ANY SAFETY SWITCHES OVERRIDDEN OR DISCONNECTED.

   B) All guards and guard doors must be in place and closed. Guard door safety switches must be operational. **Do not** start the machine if guards are missing or switches are defective.
   C) Prior to start-up, a visual check should be made to be certain that no other personnel such as adjusters, oilers, mechanics, and electricians are working on the machine. **Do not** rely only on the warning horn. You must also do a visual check to prevent injury and/or equipment damage.
   D) Clean up grease, oil, and water spills around the machine to eliminate the potential for slipping.
   E) Remove objects lying on the floor near the machine. These objects can present a tripping hazard.
   F) Tools and other equipment must be removed from the machine and stored in their proper place.
   G) Check the LINCOLN automatic grease and oil pumps for enough lubricant.
   H) Check that the parent rolls are correctly installed and that the webs are correctly threaded through the machine.

2) START-UP PROCEDURE:
   A) Turn the main disconnect switches *On* using the right safety procedures.

WARNING!
USE **CAUTION** WHEN WORKING WITH **HIGH** PRESSURE AIR.

   B) Turn *On* the main air supply valves to the machine unwind stands and interfolder.
   C) Check that the air pressure regulators are set to their correct operating settings.
   D) Pull out (Reset) any *Emergency Stop* push-pull buttons.
   E) Start the vacuum pumps and/or turn *On* the vacuum to the folder at the vacuum headers.
   F) After the machine's main power is on, the ALLEN-BRADLEY Dataliner Display runs a self-test. Watch it to make sure the unit is functioning correctly. After the self-test is completed, the ALLEN-BRADLEY Dataliner display gives a list of messages or faults to be cleared before the machine starts. Follow all messages, and clear all faults.
   G) Push the *Machine Reset* button.
   NOTE: Any time this button is flashing it must be pressed.
   H) Push the *Machine Start* push-button. This button must be held in until the light comes *On* and stays *On*. This indicates that the drive is locked on. If not held in long enough, the machine will coast to a stop.

Basic start-up procedure (Continued)

I) Use the *Main Drive Speed Control Potentiometer* to increase the speed of the folder to approximately 1/2 speed.

J) Check the vacuum settings to the folding rolls. (See the Folder Installation Drawing). Correct vacuum settings are listed in the table below.

NOTE:
The vacuum settings must be checked while the folder is running.

VACUUM	PRESSURE
Bed Roll Vacuum	10-12 Inches of Mercury.

K) Check the parent roll alignment, and adjust as necessary.

L) Check the sheets for correct cutoff length.

M) When the machine runs well and the product is acceptable turn the *Main Drive Speed Control* up to production speed.

For more information refer to the *Operator Control* section in this manual.

Machine Shutdown

Normal Shutdown:

Normal shutdown situations include:

Parent roll changes, web splices and other non-emergency instances.

To perform a normal machine shutdown press the *Machine Stop* push-button.

NOTES:

A) *Machine Stop* shuts down the entire machine.

Emergency Shutdown:

Emergency shutdown situations include:

Any time a person's safety is endangered or machine damage is threatened.

1) Press the *Emergency Stop* push-button nearest you. Several of these buttons are located on various places on the machine.

NOTES:

A) The entire machine shuts down.

B) An emergency stop automatically occurs if any guard door is opened while the machine is running.

Singlefolder Jogging Procedure

The singlefolder may be jogged from any one of several jog stations mounted throughout the machine.

1) To jog machine, turn *Jog/Run* selector switch to the *Jog* position.
2) Press the *Jog* push-button mounted at the same station. A warning horn sounds each time this button is pushed and the machine slowly turns over.

Note: The operator cannot place the selector switch in the *Jog* mode at one station, then use a *Jog* push-button from another station to jog the machine.

3) When finished jogging machine, return *Jog/Run* selector switch to the *Run* mode. The folder does not start if any switches are left in the *Jog* mode.

Manual Rotation Interfolder

The three-quarter inch square wrench fit is mounted on the main drive sheave.

It allows the interfolder to be manually set in motion for the following purposes:

A) Aids in making mechanical adjustments.

B) Trouble shooting machine operation.

C) Checking of mechanical system operation after maintenance and repair work was performed.

D) Checking alignment of various assemblies to one another.

A three-quarter inch ratchet wrench is supplied and must be in its holder in order to run the machine. The ratchet wrench holder is located near the operator's panel.

Notes:

A) If the interfolder is running, press *Machine Stop* push-button to shut down the machine.

B) The machine must not be turned in reverse unless the folder decks are open.

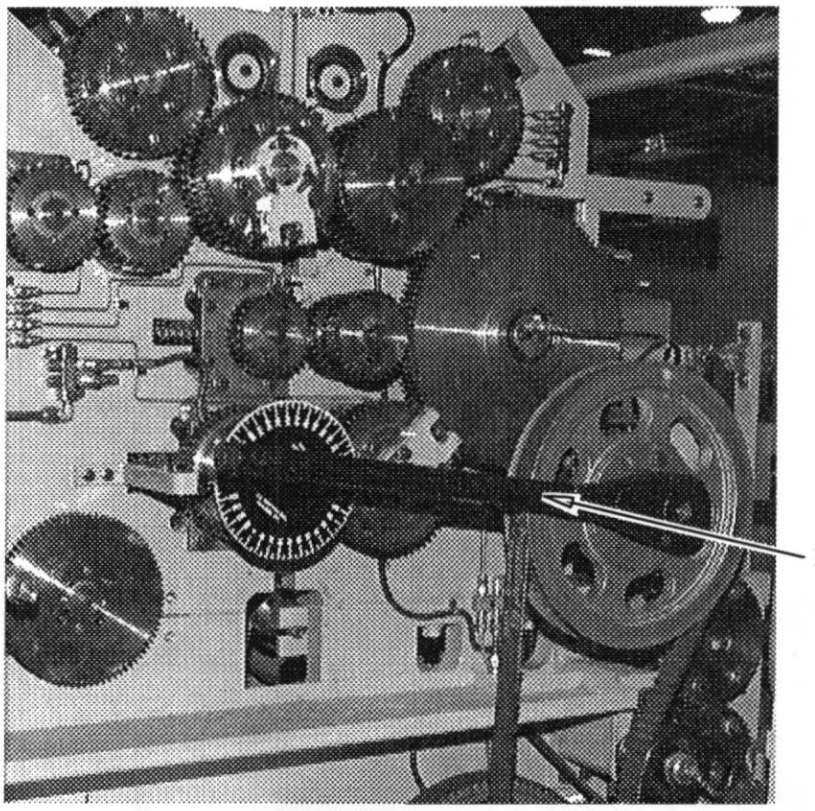


Figure 3-1 Ratchet Wrench On Drive Side Of The Machine

WARNING!
ALWAYS RETURN THE WRENCH TO ITS DESIGNATED HOLDER! THE MACHINE WILL NOT RUN IF THE WRENCH IS NOT IN ITS DESIGNATED HOLDER!

Procedure For Opening Folder Frame Deck

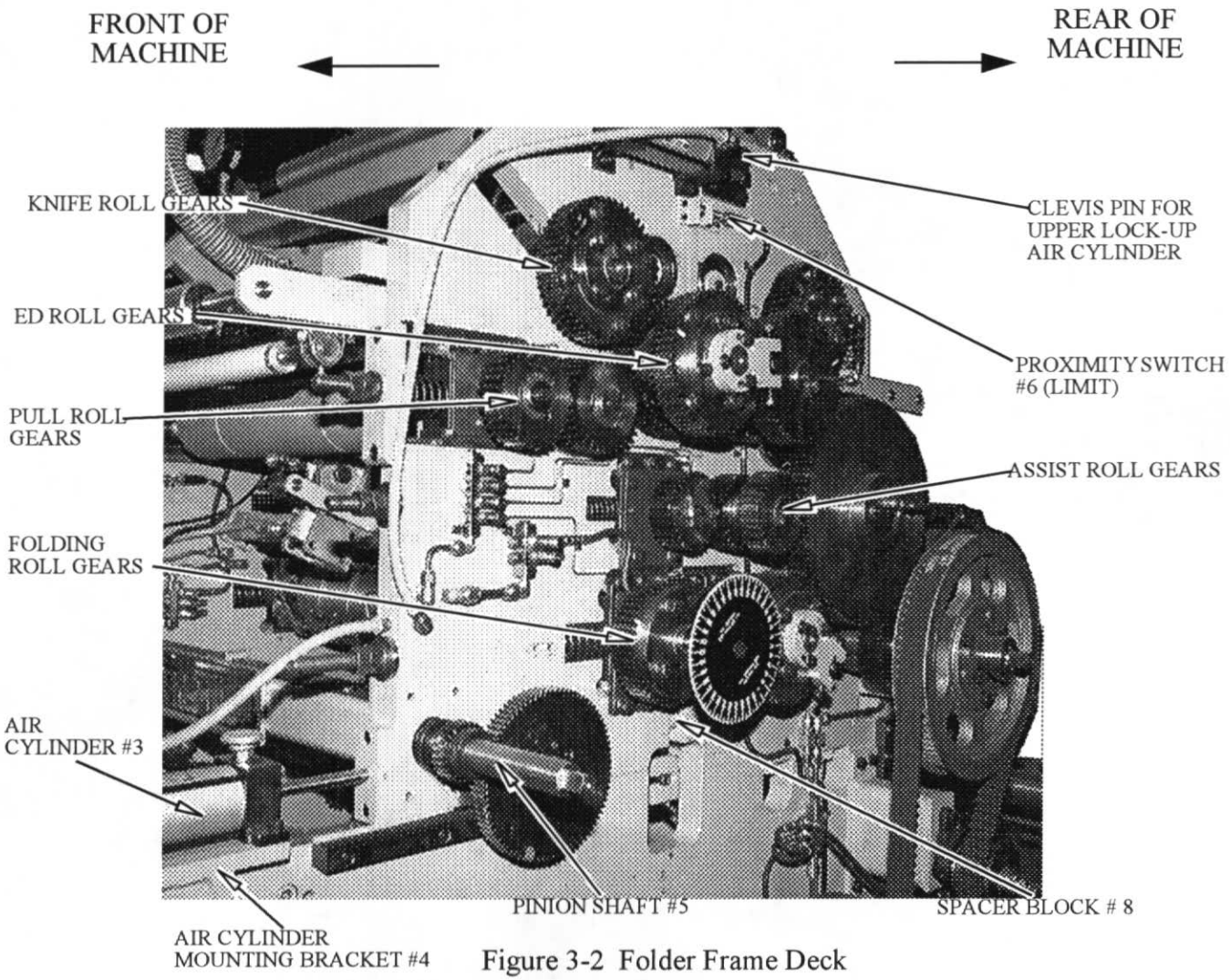


Figure 3-2 Folder Frame Deck

The folder is designed to allow the moveable frame to be opened for removal of a web jam, a roll or for maintenance purposes. Prior to opening, follow this procedure:

1) Jog or manually turn the folder forward to the engraved marks on the folder gears prior to separating the frames, so the machine will be back in time when the decks are returned to a running position. To open the moveable frame section, turn the *Folder Decks Disengage/Engage* selector switch to *Disengage*.

NOTE: The switch is spring loaded to return to center position. It allows the moveable frame section to be opened by using a ratchet wrench on the pinion Shaft #5. The frame section can be opened until the air cylinder #3 stroke bottoms out. If the frame decks need to be opened more than the air cylinder stroke allows, the air cylinders #3 must be removed along with air cylinder mounting brackets #4 and remove clevis pin for the upper air cylinders.

2) **Do not** crank the movable deck beyond the lower fixed frame section. To return the movable deck back to its running position, crank the deck toward the fixed frame with the ratchet on Shaft #5, until the movable frame is about 3/8" away from the fixed spacer Block #8. At this point, carefully match the timing marks on the gears and make sure that the tucker on the movable roll is timed so it won't bottom out against the fixed roll. After alignment of the gears, slowly crank the deck in until it has bottomed out against the spacer Block #8.

When the frames are against the stop blocks on both sides of the frame, proximity switch Trip #6 must be activated to allow the solenoid valve to put full air on the lock up cylinder, when the *Folder Decks Disengage/Engage* selector switch is engaged. This is a safety so the rolls do not get damaged, if a tucker or drive gear were not matched up and the air cylinders were extended prematurely. Make sure there is no daylight between the movable frames and the spacer blocks. The folder should now be turned over by hand to assure correct timing prior to running production. At this point the guard doors must be closed. Turn the *Folder Decks Disengage/Engage* selector switch to *Engage*, this actuates the solenoid valve and puts full air on the lockup cylinders. Do a *Machine Reset*, and then jog the machine to assure correct timing before proceeding any further.

Operator Routine During Machine

Once the folder has been started and is operating at production speed, the following routine actions are recommended:

1) Watch for paper jams occurring throughout the machine.
2) Check web alignment through slitters and folding head.
3) Inspect the product to ensure it meets specifications.
4) Become familiar with the operating sounds of the machine. Be alert for different, unusual or sudden noises and be prepared to shut down machine to avoid damaging it.
5) Watch for expiring parent rolls.
6) Keep the floor area surrounding the machine clean and free of obstacles.
7) Clean up oil, grease and water spills around the machine to eliminate potential slipping hazards.
8) **Never** reach around a guard into a "running" machine for any reason.
9) Always follow safety procedures.

Ross Main Air Valve

The function of the ROSS main air valve is to quickly dump air pressure out of the pneumatic system. All machine air used in operating the Bretting equipment should be plumbed through this valve.

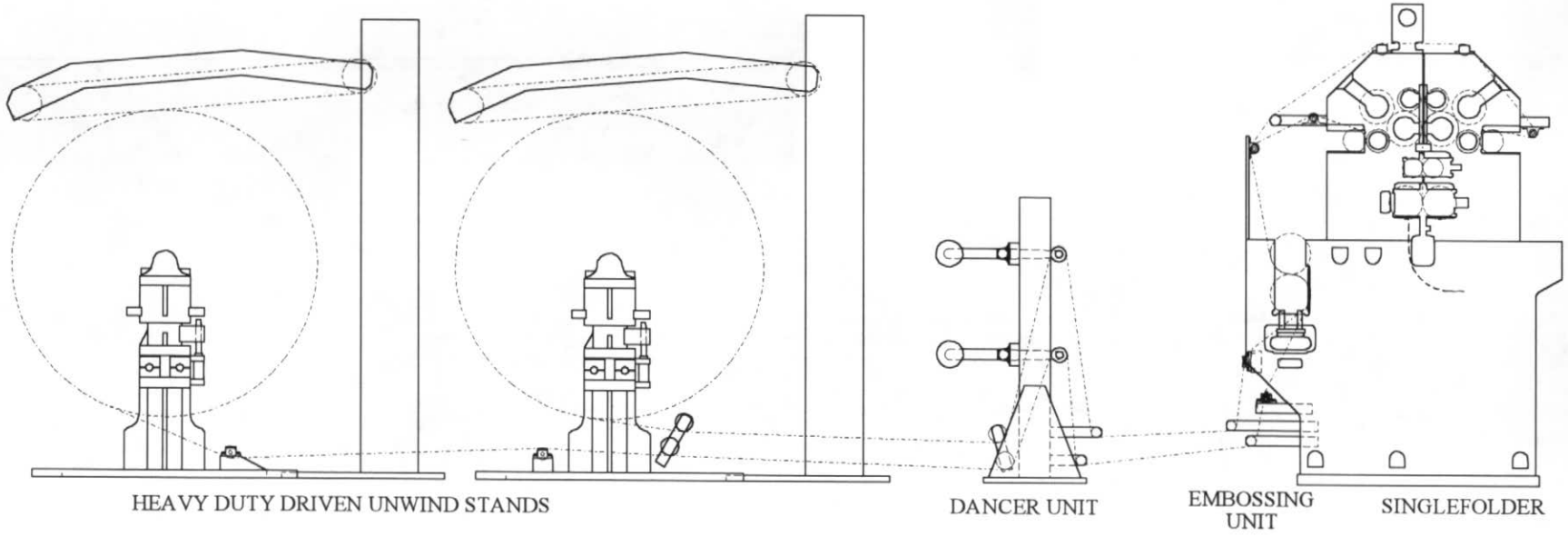
OPERATION:

1) Clear personnel from area before shifting valve.
2) **PUSH** red tee handle in **TO EXHAUST** air.
3) Lock valve out.
4) Verify no downstream pressure left in system.

Section B

Web Threading Diagram

Web Threading Diagram



Section C

Air Regulator Settings

Regulator Pressure Settings

NOTE: *All regulators should have an engraved tag identifying the device and pressure setting.*

Unwind Stand Air Regulator Settings

REGULATOR	RECOMMENDED SETTINGS	COMMENTS
Stand Main Air	60-80 psi	
Stand Belt Pressure	0-20 psi	Air present determines the amount of belt pressure on parent roll.

Singlefolder Air Regulator Settings

REGULATOR	RECOMMENDED SETTINGS	COMMENTS
Folder Main Air	60-80 psi	
Count Marker Solenoid	20-40 psi	
Oil Lube Solenoid	40-60 psi	
Grease Lube Solenoid	40-60 psi	
Machine Brake Solenoid	10-30 psi	
Folder Thread Assist	70 psi	

Chapter 4 Unwind Stand

Section A

Unwind Stand Safety

Unwind Stand Safety

Read and follow all safety instructions in the **SAFETY** section of this manual.

General Unwind Stand Safety

Caution!
No maintenance or service work should be performed on the machine without referring to the General Safety Section: "Maintenance and Servicing Equipment Shutdown Procedures" and "Restoring Equipment to Service Procedures" in Chapter 1 in this manual.

1) Know the locations of all *Emergency Stop* and *Machine* or *Drive Stop* push-buttons.
2) Know the locations of all main air shut-off valves.
3) Keep all guards in place. Never operate a machine with any of the guards off or safety switches overridden or disconnected.
4) Use **CAUTION** when "Scalping" material off of rolls.
5) Stay clear of all rotating parts, such as belts, sheaves, sprockets, chains, drive shafts, etc...
6) Use **CAUTION** when loading or unloading parent rolls.
   A) Follow the hoist manufacturers instructions and procedures. Ensure the hoist used has adequate lifting capacity. Do not exceed this limit.
   B) When using roll hooks, make sure roll is centered in the hooks. Make sure of roll hooks lifting capacity. Do not exceed this limit.
   C) When using "Straps", position the "Straps" properly so the roll will not tip out.
   D) Make sure all personnel are clear when moving rolls.
   E) Never stand under a parent roll while it is in a hoist.
   F) Never leave a parent roll unattended while hanging in a hoist.
   G) Keep hoist clear of the machine when not in use.
7) Use **CAUTION** and make sure all personnel are clear when operating the belt drive arms.
8) Stay clear of the belt drive arm and drive belts, dancer arms and counterweights while the machine is running.
9) Keep clear of web threading drive components and belting when threading or running the machine.
10) Do not exceed the roll size and weight capacity of the unwind stand. Consult the *C.G. Bretting Engineering Department* for more information.
11) Do not use excessive air pressure settings. Do not modify plumbing or remove pneumatic devices.

Unwind Stand Safety

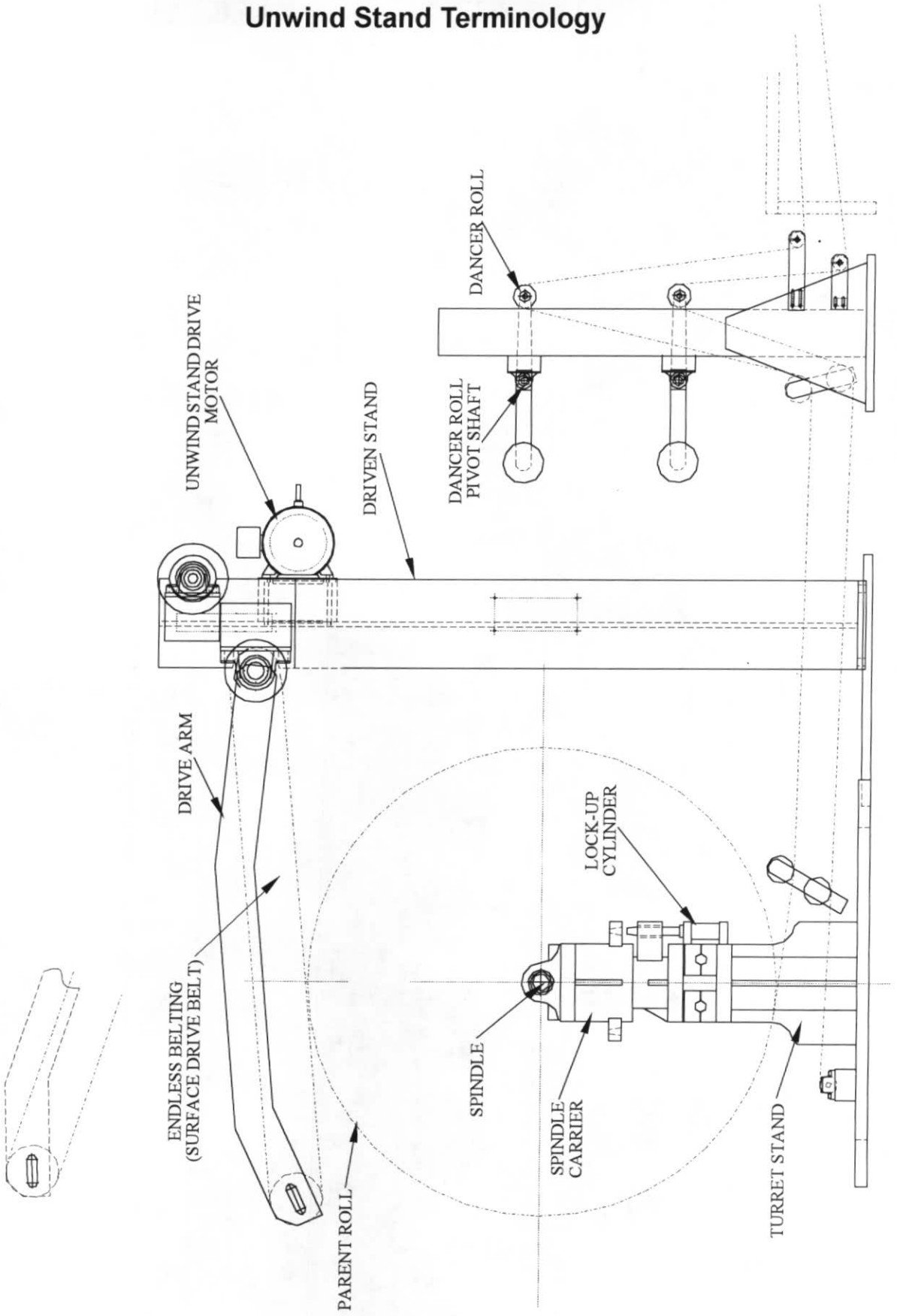
Heavy Duty Driven And Turret Stands:

1) Use **CAUTION** when loading rolls onto turret stand spindles.
2) Make sure turret spindles are secure in their pillow blocks bearings, tighten all set screws.
3) **Do not** exceed the roll size and weight capacity of the turret spindle, consult C.G. Bretting Mfg. Co. or other spindle manufacturer for information.
4) Make sure to position roll properly on turret spindle.
5) Make sure that the turret spindle locking collars are properly positioned and are secure on the turret spindles.
6) Use **CAUTION** when locking up turret stands and spindles.
7) Use **CAUTION** when rotating turret spindles 180 degrees during roll changeovers.
8) On machines with hand valve operation for lock-up and belt arm cylinders, the operator's must know and understand which hand valve controls which function.

Section B

Unwind Stand Terminology

Unwind Stand Terminology



Terminology For Unwind Stands

Heavy Driven Unwind Stand

Located ahead of the turret stand and before the dancer unit is the driven unwind stand. The unwind stand's main function is to unwind the parent rolls that are mounted on the turret stand.

Belt Drive Arm

An arm consisting of two pulleys with an endless surface drive belt stretched between them. This assembly unwinds paper off the parent roll at a controlled rate. The rate at which the roll is unwound is controlled by the dancer position sensor in conjunction with the electronic drive shaft. The speed control helps to maintain proper web tension through the machine.

Lift Cylinder

This air cylinder raises or lowers the belt drive arm by pivoting the belt drive arm on the pulley shaft. It is mounted on the back side of the unwind stand. It is controlled by a selector switch mounted on the operator side of the unwind stand. When the selector switch is in the *Up* position, the air cylinder extends raising the belt drive arm. In the *Down* position, the air cylinder retracts releasing the air pressure allowing the weight of the arm to lower the arm.

Web Tension

Tensioning is a continuous pull or stretch imparted on the web as it runs through the machine. Variations in the amount of tension results in unsatisfactory finished products.

Dancer Position Sensor

This unit consists of a proximity sensor positioned near a cam. The cam is on the end dancer pivot shaft. Changes in web tension move the dancer roll away from its *Home* position. This movement is translated to voltage fluctuations through the cam/sensor relationship. The speed of the electronic drive shaft is adjusted continuously with this feedback.

Electronic Drive Shaft

It is a vector drive motor used to regulate drive speeds of the individual unit. There is one of these drive shafts, located at the unwind stand and one at the embossing station.

Dancer Unit

The dancer unit monitors the tension of the web of paper. Movement of the dancer is sensed and fed to the electronic drive to adjust the speed at which the parent roll is unwinding. The roll should be unwinding at such a rate as to keep the dancer roll in a horizontal position. The dancer unit can be adjusted to help eliminate some wrinkles and help prevent the plies of paper from wandering.

Dancer Roll

The web passes over the dancer roll. The tension of the paper is monitored by the dancer position sensor and cam. The parent roll should be unwinding at such a rate as to keep the dancer roll in a horizontal position.

Counterweights

The counterweights are mounted opposite the dancer roll on the counterweight arm. These counterweights are used to increase or decrease the web tension. To increase the tension on the web, the counterweights are moved away from the dancer roll. Increasing the tension can help eliminate wrinkles or prevent wandering of one or more plies of the web. To decrease the tension on the web, the counterweights are moved toward the dancer roll. The proper tension is necessary to achieve the correct cutoff in the folder.

Terminology For Turret Stand

Turret Stand

Located before the heavy duty driven unwind stand is the turret stand. The turret stand holds two (2) parent rolls. These rolls are held on separate spindles which are mounted in pillow blocks. This method of holding the rolls makes it possible to load a new roll on to the empty spindle while the other roll is unwinding, thereby minimizing the machine down time for rethreading. Paper roll clamps or an inflatable rubber bladder are used to hold the roll in place on the spindles.

Spindle

The spindles support the parent rolls. There are different types of spindles, the most common spindle is a heat treated solid steel shaft. Another type of spindle uses air pressure inside an air bladder which forces out a series of buttons. These buttons, when in the expanded position, raise out of the spindle shaft and hold against the inside of the roll core. Air pressure is released by an air valve located in the end of the spindle.

Spindle Carrier

This is the top assemble of the turret stand. The spindles are mounted in pillow blocks on the top of this assembly. The spindle carrier moves laterally on hardened shafts for web alignment. It also rotates 180 degrees, allowing a new roll to be swung into place and spliced to the existing web.

Turret Lock-up

This mechanism locks the turret into place and prevents the turret from moving during operation. A lock-up pin is controlled by an air cylinder. This air cylinder is actuated by a solenoid and a selector switch. When the selector switch mounted on the driven stand is moved to the *Unlock* position, the spindle support cylinder extends and the turret lock-up cylinder retracts. The lock-up pin is pulled out of the housing, allowing the turret to pivot. If moved to the *Lock* position, the spindle support cylinder retracts and the lock-up cylinder extends locking the turret in place.

Lateral Register

An air motor drives the lateral register adjusting screw "In" or "Out". This lateral movement is used to line up the center of the web with the center of the embossing rolls. A selector switch mounted on the operator's control station controls this drive.

Outboard Support

Located next to the turret stand. It is used to support the free end of the spindle. An air cylinder moves the spindle support which is mounted in housings with oilites. The air cylinder is controlled by the same selector switch as the turret lock-up pin cylinder. When the selector switch is moved to the *Unlock* position, the spindle support cylinder extends moving the spindle support away from the end of the spindle. If placed in the *Lock* position, the spindle support cylinder retract moving the spindle support onto the end of the spindle.

Section C

Unwind Stand Operation

Unwind Stand General Operation

The turret unwind stand supports two (2) individual parent rolls mounted on two (2) separate in-line cantilevered spindles. This configuration allows a new parent roll to be loaded onto the empty spindle while the opposite spindle is in operation unwinding a parent roll.

When the parent roll expires, the belt drive arm is raised up off the roll through the use of a selector switch. Another selector switch unlocks the turret and retracts the outboard support tube off the spindle end. The turret is now free to rotate 180 degrees, moving the expired roll out and the spindle supporting a new parent roll in.

With a selector switch, the turret is simultaneously locked in the *Run* position, to keep it from moving during operation and the outboard support tube is extended over the end of the spindle providing additional support.

The new parent roll is spliced to the tail of an existing web and the belt drive arm is lowered onto the new roll with a hand valve or selector switch. The unwind stand is now ready for operation and the empty spindle can be loaded any time before the new roll expires.

A lateral register mechanism mounted on the turret stand allows the parent roll to be shifted 1" in either direction. This permits the paper web to be aligned to the centerline of the embossing rolls and slitter on the folder. A selector switch located at the operator control panel adjusts the movement of this mechanism.

As the roll unwinds, it is necessary to maintain the web tension. The tension control system consists of an electronic drive shaft (vector drive motor), a dancer position sensor with a cam and dancer roll assembly. These components form an interdependent system, which acts continuously on the web to maintain a consistent tension.

The vector motor drives the surface drive belt on the belt drive arm. The dancer position sensor is mounted on the end of the dancer roll pivot shaft. This sensor is an electrical device that reads the distance that a cam surface moves from a zero reference point. The zero reference point is when the dancer roll is in a horizontal position. As the distance between the cam and sensor increases or decreases, a voltage signal is sent to the servo motor. The fluctuations in the voltage signal causes the servo motor to speed up or slow down which in turn alters the speed of the surface drive belt. This takes place to bring the dancer roll back to its zero reference or original starting point.

The low roll detection system will flash a blue light, located on the folder and a *Low Roll* message will be displayed on the Dataliner and/or operator interface screen. There is a *Low Roll Acknowledge* button on the operator panel and one on the front unwind stand that turns off the horn and blue light but does not stop the machine automatically. It is advisable to monitor the roll at this point and stop the machine with a *Machine Stop* button at the appropriate time.

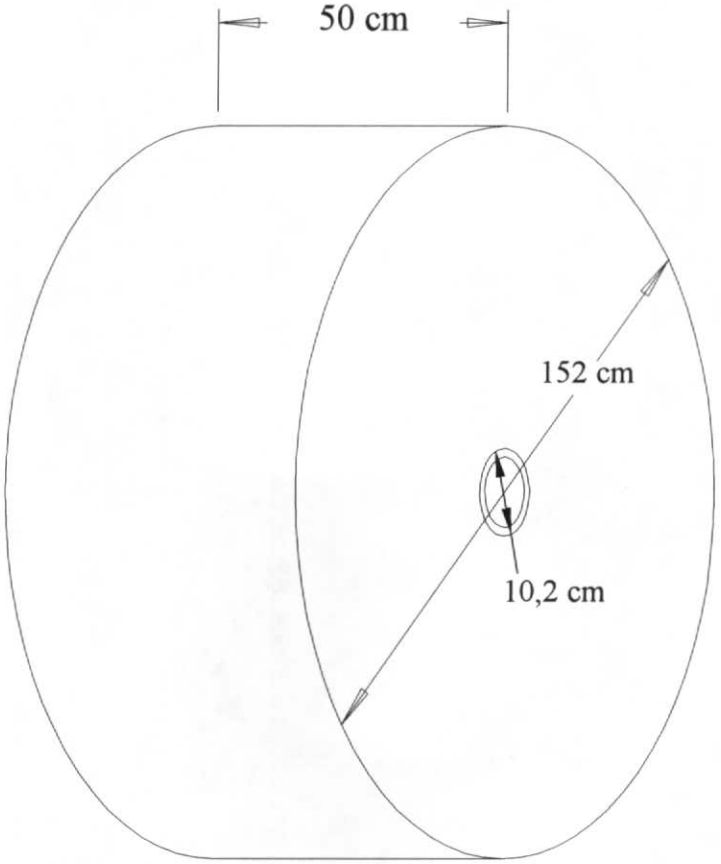
Changing To A New Parent Roll On The Heavy Duty Driven Unwind Stand

Procedure

1) Before the parent roll completely runs empty, shut down the machine by pressing the *Machine Stop* push-button.
2) Raise the belt drive arms by turning the *Belt Arm Down/Up* selector switch to the *Up* position.
3) Unwind approximately 2 to 2-1/2m of paper from the spent parent rolls. This length is used for splicing onto the new roll. Tear or cut off the paper, and make the edges as straight as possible.
4) Skin back and remove about 4 or 5 layers of paper from the new parent roll. If the new roll is damaged, take more layers off the roll.
5) Place a strip of double sticky back tape, about 5cm from the end, across the new parent roll.
6) Turn the *Turret Unlock/Lock* selector switches to *Unlock*. This retracts the spindle outboard supports and lowers the turret lock-up pins.
7) Manually rotate the turret 180 degrees until the new parent roll is in the unwind position. Be sure to align the spindle with the outboard support.
8) Turn the *Turret Unlock/Lock* selector switch to *Lock*. This extends the outboard supports onto the spindles and at the same time raises the turret lock-up pins to prevent the turrets from rotating.
9) Remove the protective paper from the double sticky back tape. Pick up the "tail" from the empty parent roll, and firmly attach it to the tape on the new parent roll.
10) Manually rotate the new parent roll backwards until the paper web is taut and the appropriate dancer roll is horizontal.
11) Make sure that all personnel are clear of the belt drive arm.

WARNING!
ALWAYS MAKE SURE THAT ALL PERSONNEL ARE CLEAR OF THE MOVING BELT DRIVE ARM BEFORE LOWERING IT.

12) Turn the *Belt Arm Down/Up* selector switch to *Down* to lower the belt drive arm onto the new parent roll. (Keep the web taut when the belt arm comes down).
13) Check and clear the entire machine of other personnel or tools. Then start the folder, or *jog* the splice through the machine. Discard packs which contain splices.
14) Run the folder to operating speed, and continue with the normal machine operation.



Parent Roll With Dimensions

Chapter 5 Embossing Unit

Section A

Embossing Unit Safety

Embossing Unit Safety

Read and follow all safety instructions in the **SAFETY** section of this manual.

General Safety

Caution!
No maintenance or service work should be performed on the machine without referring to the General Safety Section: "Maintenance and Servicing Equipment Shutdown Procedures" and "Restoring Equipment to Service Procedures" in Chapter 1 in this manual.

1) Know the locations of all *Emergency Stop* and *Machine* or *Drive Stop* push-buttons.
2) Know the locations of all main air shut-off valves.
3) Keep all guards in place. Never operate a machine with any of the guards off or safety switches overridden or disconnected.
4) **Do not** reach into a running machine for any reason! Stay clear of moving or rotating components.
5) Use **CAUTION** when threading the embossing rolls. **Do not** force the webs between the center of the rolls. Thread the webs through the ends of the rolls or tape the webs to the rolls then "jog" the machine over. **Do not** feed the web into the embossing roll nips with your fingers.
6) **Do not** wear any loose clothing or jewelry that could get caught in moving parts. Hair should not hang as to impair vision or permit the possibility of becoming caught in the machine or its moving parts.
7) **Do not** use razor blades or any other tools to remove web wad-ups, roll surfaces may be damaged or fingers may be cut. Make sure the machine is stopped before attempting to clear any wrap-up.
8) **Do not** engage the handwheel while the machine is running.
9) **Do not** run or jog the machine with the handwheel engaged.
10) Make sure the machine is stopped before adjusting the roll gaps.
11) Keep hands clear when jogging the web through the embossing rolls, avoid the in-running nip area. Always pull on the web on the "Opposite Side" of the nip area.

Section B

Embossing Unit Terminology

Embossing Unit Terminology

Embossing Rolls

The main function of the embossing rolls is to place the engraved pattern from the embossing rolls to the web. A second function is related to package bulk. If there is too much emboss on the web, it can cut into the web or it can cause too much product bulk. If there is too little emboss on the web, it may not show up on the web at all or it can cause too little product bulk. A good rule-- the embossing pattern should be tight enough to hold the sheets together as they come out of the rolls, but loose enough to be able to separate the sheets easily without tearing the sheets.
There are two types of embossing rolls; Paper on Steel or Matched Steel.

Matched Steel Rolls

Consists of a male engraved roll and a female engraved roll. The male roll should be placed into the embossing frames first, so the high point of the embossing pattern is pushed out and so it will not be "washed-out" while going over idler rolls and the plows. The rolls have a keyway cut into the side face of both rolls. The engraving was started with one key inserted in both slots at the same time. The key should be placed into the slots to ensure the embossing pattern and the gears are meshed properly. When any lateral or circumferential adjustments are made, the backlash should also be opened to allow for adjustments. The gears should be marked and the key inserted when removing the rolls from the deck to have a starting reference point for any adjustment when the rolls are reloaded. (See Lateral and Circumferential Write-up - Embossing Section).

Felt Wipes

The matched steel rolls have a felt wipe assembly for each roll. This felt wipe assembly uses mineral oil to keep the dust and paper from sticking to the rolls.

Air Loading Of Rolls

To engage or load the embossing rolls into their running position, two (2) air donuts (one at each side frame) are inflated to raise the lower embossing roll up against the upper embossing roll.

Wrap-Up Detectors

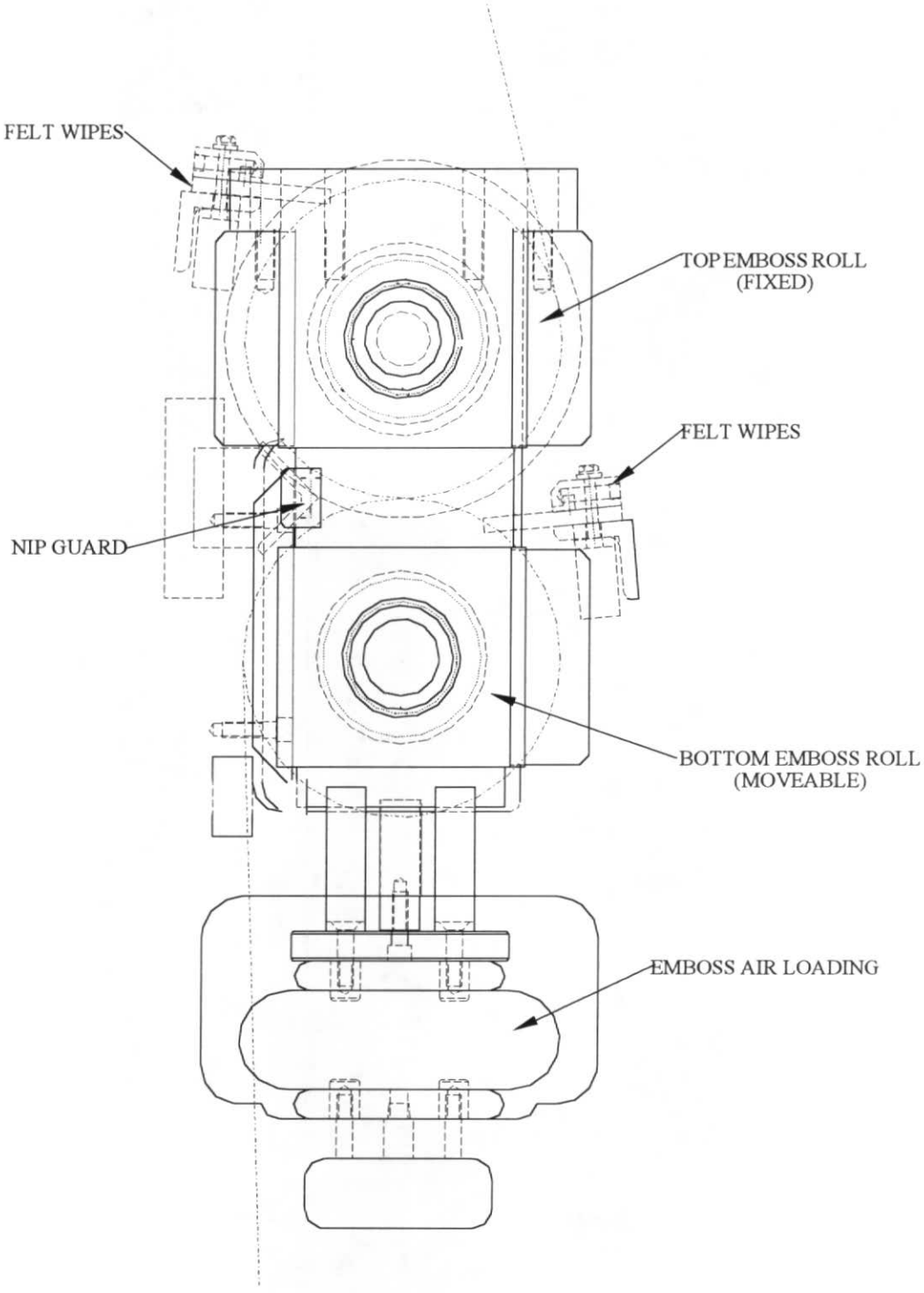
The wrap-up detectors are located on each of the lower embossing roll bearing housings.
They consist of:

- a trip arm mounted to the bearing roll housings, and
- a limit switch.

If a wad-up occurs, the wad of paper pushes the embossing rolls apart causing the lower embossing roll bearing housing to pivot the trip arm away from the limit switch causing the machine to shut down.

Air Blast

The embossing rolls have an air blast bar on each roll to blow air onto the rolls to clean them. The air comes on with the photoeye air blast solenoid.



Embossing Unit Layout

Section C

Embossing Unit Operation

Embossing Unit Operation

The embossing unit houses the embossing rolls which are engraved to customer specifications.

The main function of the embossing rolls is to place the engraved pattern from the embossing rolls to the incoming webs. A second function of the embossing rolls is related to package bulk. Too much emboss on the web can cut into the web or it can cause too much package bulk. Too little emboss on the web may not show up on the web or it can cause too little package bulk.

The nip openings are adjustable and are used to control the amount of emboss on the webs.

The embossing rolls are lubricated with mineral oil to keep dust and the webs from "sticking" to the rolls.

The embossing rolls wrap-up detection systems detect web wrap-ups of the embossing rolls and shut down the machine to prevent damage to the embossing rolls.

An air blast comes on to help clear dust from the rolls.

Chapter 6 Singlefolder

Section A

Singlefold Safety

Folder Safety

Read and follow all safety instructions in the **GENERAL SAFETY** section of this manual.

General Folder Safety

Caution!
No maintenance or service work should be performed on the machine without referring to the General Safety Section: "Maintenance and Servicing Equipment Shutdown Procedures" and "Restoring Equipment to Service Procedures" in Chapter 1 in this manual.

1) Know the locations of all *Emergency Stop* and *Machine* or *Drive Stop* push-buttons.
2) Know the locations of all main air shut-off valves.
3) Keep all guards in place. **Never** operate a machine with any of the guards off or safety switches overridden or disconnected.
4) **WARNING! Reaching into a running machine for any reason could result in** *serious injury or death!* Stay clear of moving or rotating components.
5) **WARNING!** Threading the slitter assembly is a potentially *hazardous procedure,* and if proper precautions are not taken it could result in *serious injury.* Slitter blades are sharp and will cause serious bodily injury.
6) Keep all slitter blade guards in place, do not operate the machine without these guards.
7) Use blade guards or safety covers when handling slitter blades during blade changes.
8) Keep hands and fingers clear of sharp blades during slitter set-up to slitter anvils.
9) Always wear proper safety equipment when working on the machine including safety glasses, safety shoes, gloves, etc.
10) **WARNING!** Threading the folder pull rolls is a potentially *hazardous procedure,* and if proper precautions are not taken it could result in *serious injury.* **Do not** force the webs between the center of the rolls. Thread the webs through the ends of the rolls or tape the webs to the rolls then jog the machine over. **Do not** feed the web into the pull roll nips with your fingers.
11) Keep hands clear when jogging the webs through the pull rolls, avoid the in-running nip area. Always pull on the web on the opposite side of the nip area.
12) Make sure the machine is stopped before adjusting the roll gaps.
13) **Do not** reach in to remove paper or wad-ups from the packer area while the machine is running. Stop the machine to remove any wad-ups.
14) Use handrails on cat walks and steps of the machine.
15) Keep work area clean. Clean up any spills.
16) All ***accident prevention signs*** must be closely observed, to prevent injury and/or machine damage. **Never** remove any such signs. If the signs have been removed or have become illegible, replace the sign immediately. BRETTING will provide free replacement signs. Contact customer service at 715-682-5231 for more details.
17) Only perform maintenance and adjustments you are trained to do, otherwise call the proper maintenance personnel.
18) Avoid climbing on or over and do not crawl under a machine, especially while the machine is running.

19) Use **CAUTION** when using air hoses and/or when working around any high air pressure couplings.
20) **Do not** wear any loose clothing or jewelry that could get caught in moving parts. Hair should not hang as to impair vision or permit the possibility of becoming caught in the machine or its moving parts.
21) **Do not** adjust the variable speed drive units (Tapercones, Specons or PIV's) when the folder is **not** running.
22) **Do not** use electrical cabinets, wireways or conduit as steps or handles. Always look where you are going to place your hands and feet. Shut down the machine, if it is necessary to climb up on the machine.
23) Be aware of all pinch points and other safety hazards on the machine.
24) **Do not** clean the machine while it is running. Use the proper safety equipment when blowing down the machine.
25) Keep all tools and parts off the machine. Check for objects after any work has been performed on the machine.
26) Make sure all machine components are securely tightened down.
27) **Do not** use excessive air pressure settings.
28) **Do not** modify plumbing or remove pneumatic devices.
29) **Do not** jog machine, if the folding decks are not properly secured.
30) When manually rotating the machine ensure that all personnel are clear of pinch points.

Section B

Singlefolder Terminology

Folder Terminology

Terminology For Singlefold

Bowed Rolls

Located before the pull roll assemblies. The main function of these rolls is to smoothen the wrinkles out of the webs before they enter the pull roll assemblies.

Pull Rolls

Located before the each set of knife and bed rolls. Each pull roll assembly consists of (1) "poly" covered and (1) knurled roll. The pull roll assemblies are driven off the knife rolls. The function of the pull rolls is to control the web from the embossing unit to the bed roll. The speed of the pull rolls are approximately the same as the knife and bed rolls, these speeds may vary slightly due to the types of paper being run on the machine.

Slitter Assembly

This assembly consists of a circular knife and a mounting bracket, located underneath the pull rolls. The function of the slitter is cut the web longitudinally (lengthwise) in half. The operator can align the web with the embossing unit and the folder using the *Lateral Register* selector switch.

Knife Roll

Located next to the bed rolls. The knife rolls hold the serrated knife blades which works in conjunction with the bed and pull rolls to achieve the proper towel cutoff length.

Bed Roll

Located adjacent to the knife roll and below the pressure rolls. The bed roll uses vacuum to hold the sheets and provides a relief area for the serrated knife blades to pass through the sheet during cutoff.

Pressure Roll

The pressure rolls are "poly" covered rolls mounted in an eccentric bearing housing just above the bed rolls and adjacent to the knife rolls. The pressure rolls create a tight drag on the sheets at the pressure and bed roll nips, which are critical to maintaining the correct sheet length during cutoff.

Assist Rolls

Located directly below the bed rolls and above the folding rolls. These knurled rolls assist the cutoff towels from the bed rolls to the folding rolls, keeping them lined up to produce better, more consistent folds.

Folding Rolls

These two rolls are mounted a short distance below the assist rolls. Their function is to interfold the sheets together. Each folding roll contains two rows of "Grippers" and two rows of "Tuckers" which interact together to interfold the sheets. Notice that the grippers and tuckers alternate on the rolls and where one roll has a gripper, opposing it on the other roll will be a tucker. The movements of these grippers and tuckers are governed by cams and cam followers mounted on the ends of the rolls. A brief description of the sequence of operation for the grippers and tuckers is as follows:

A) Tucker tucks the sheet into the opposing gripper.

B) Gripper then closes holding the sheet.

C) Next sheet comes down and again a tucker inserts it into a gripper.

D) The gripper will open, releasing the interfolded sheets when it approaches the web guides forming a zig zag fold.

Grippers

Located in the folding rolls mounted on the gripper shafts, the "Grippers" work with the "Tuckers" to interfold the sheets. The "Grippers" close around the "Tuckers" grabbing the sheets. The gripper opens and releases the interfolded sheets just before the towel guides.

Tuckers

Located in the folding rolls. The "Tuckers" work with the "Grippers" to interfold the sheets. The "Tuckers" tuck the sheets into the "Grippers" opposite it, the grippers then close around the tuckers gripping the sheets causing the interfolding of the sheets.

Vacuum System

This system consists of a vacuum pump to create vacuum, with vacuum valves, slides and timing brackets to control it. The vacuum pump through hoses, supplies suction to the valves mounted on the end of the bed rolls. Vacuum drawn through ports in the rolls provide a means of gripping and carrying the sheets as they flow through the folding head. Timing brackets along with the slides inserted into the valves provide a method of starting and stopping the vacuum to each roll.

Count Marker System

The count marker system consists of a count shaft, marker fingers, air cylinder, an "Omron" counter and a sensor mount near the cam. The function of this system is to adjust and keep track of the product as well as to mark the sheets separating the end of one count and the start of the next count.

Star Wheels Assembly

The star wheel assembly is located beneath the folding rolls and before the discharge tray. It consists of two sets of notched wheels driven by a small gearmotor. The functions of this assembly are to move the product down away from the folding rolls and to aid in creating the proper back pressure to the folding rolls. This back pressure is critical to producing a good quality built product.

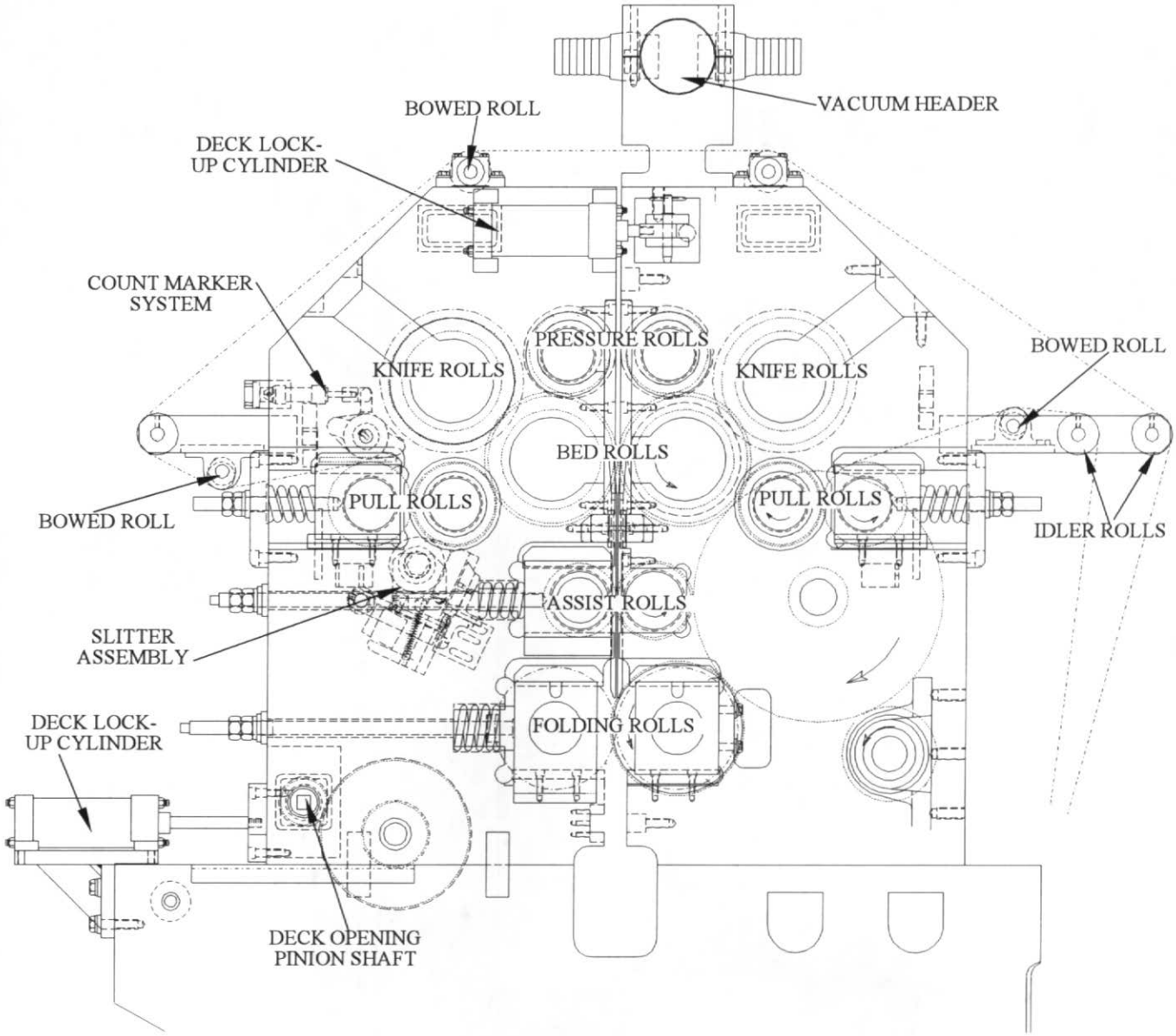
Discharge Tray

The discharge tray is located under the folding rolls and after the star wheel assembly. It is a long tray with a series of pulleys and endless drive belts. The functions of the discharge tray is to move the product away from the folding rolls while at the same time creating the back pressure to the folding rolls. This back pressure is critical to producing a good quality built product.

Singlefolder Assembly

MOVEABLE SIDE

FIXED SIDE



VIEW FROM THE DRIVE SIDE

Section C

Singlefolder Operation

Introduction To The Folding Head

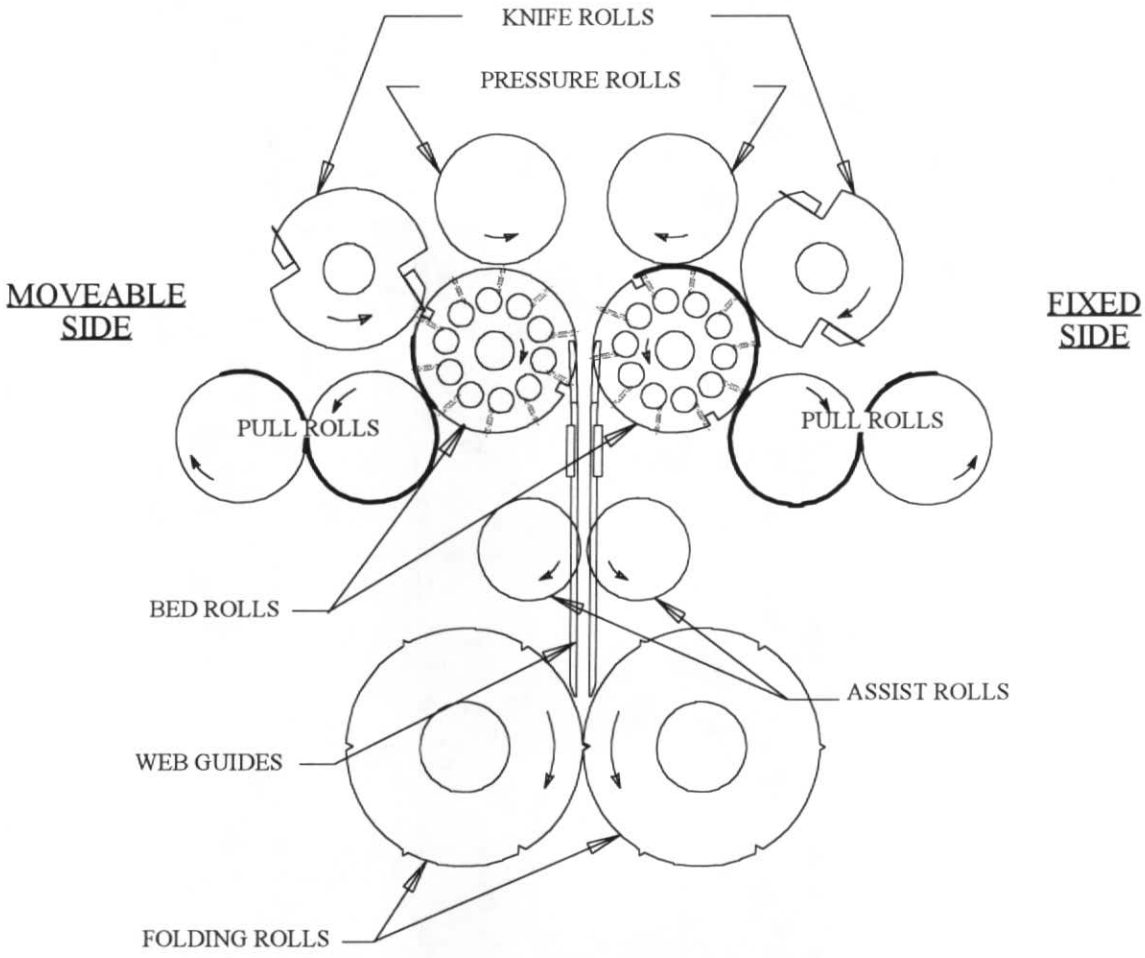
The folding head, with the numerous assemblies contained there in, represents the heart of the machine. This is where the web is manipulated down to individual sheets.

Careful attention is given to the area where the paper first enters the folder. It enters the folding head over bowed rolls. This is to remove wrinkles prior to the pull roll assembly. The pull rolls are located just prior to the knife and bed rolls so that a consistent web tension can be maintained as the product advances into the next station.

The pull rolls, bed rolls, knife rolls and pressure rolls all work together to cut off and feed approximately 10.750" long sheets to the assist rolls. Vacuum holds the sheets to the bed roll until they are transferred to the assist roll.

The overlapped sheets are then fed to the mechanical folding rolls, the final components of the folding head. These rolls are generally identical: One groove, contains the gripper assembly, and the next groove holds the tucker. The rolls are mounted in the frame such that the tucker and gripper interact on the web. This interaction causes the cutoff sheets to fold in half and combine to "Interfold" one sheet with the one in front and behind it.

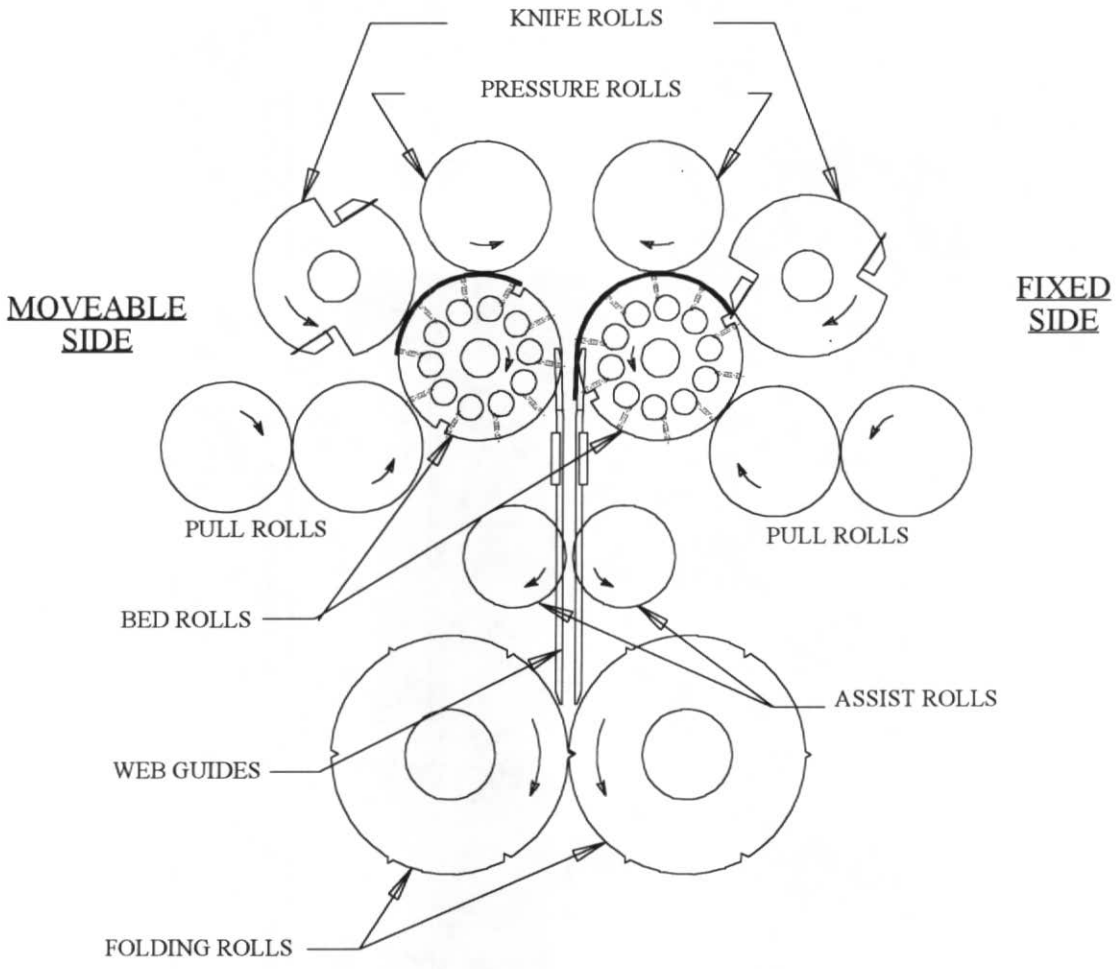
SINGLEFOLD INTERFOLDER
SEQUENCE OF OPERATION
SERRATED CUTOFF



Stage 1

The pull rolls, knife rolls, bed rolls, pressure rolls, assist rolls and folding rolls all work together. Starting at the pull rolls, the sheet is fed around the knife and bed rolls. Vacuum picks up the sheet approximately 1/2" to 1-1/2" before the nip of the knife and bed rolls transferring the sheet around to the pressure roll.

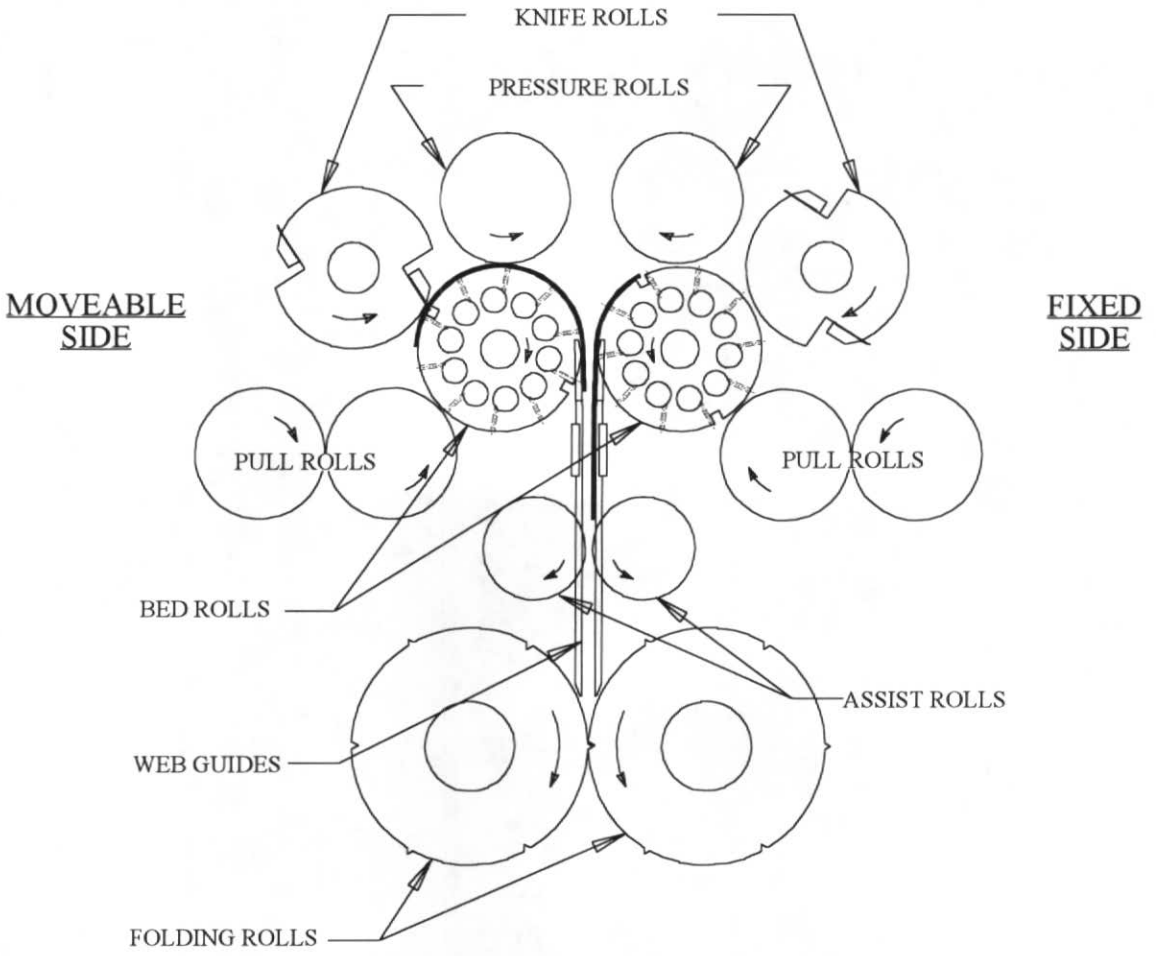
SINGLEFOLD INTERFOLDER
SEQUENCE OF OPERATION
SERRATED CUTOFF



Stage 2

Vacuum holds the sheet to the bed roll as it is transferred around to the pressure roll. The pressure roll stretches the sheet around the bed roll as the knife roll cuts the sheet, as shown on the fixed side.

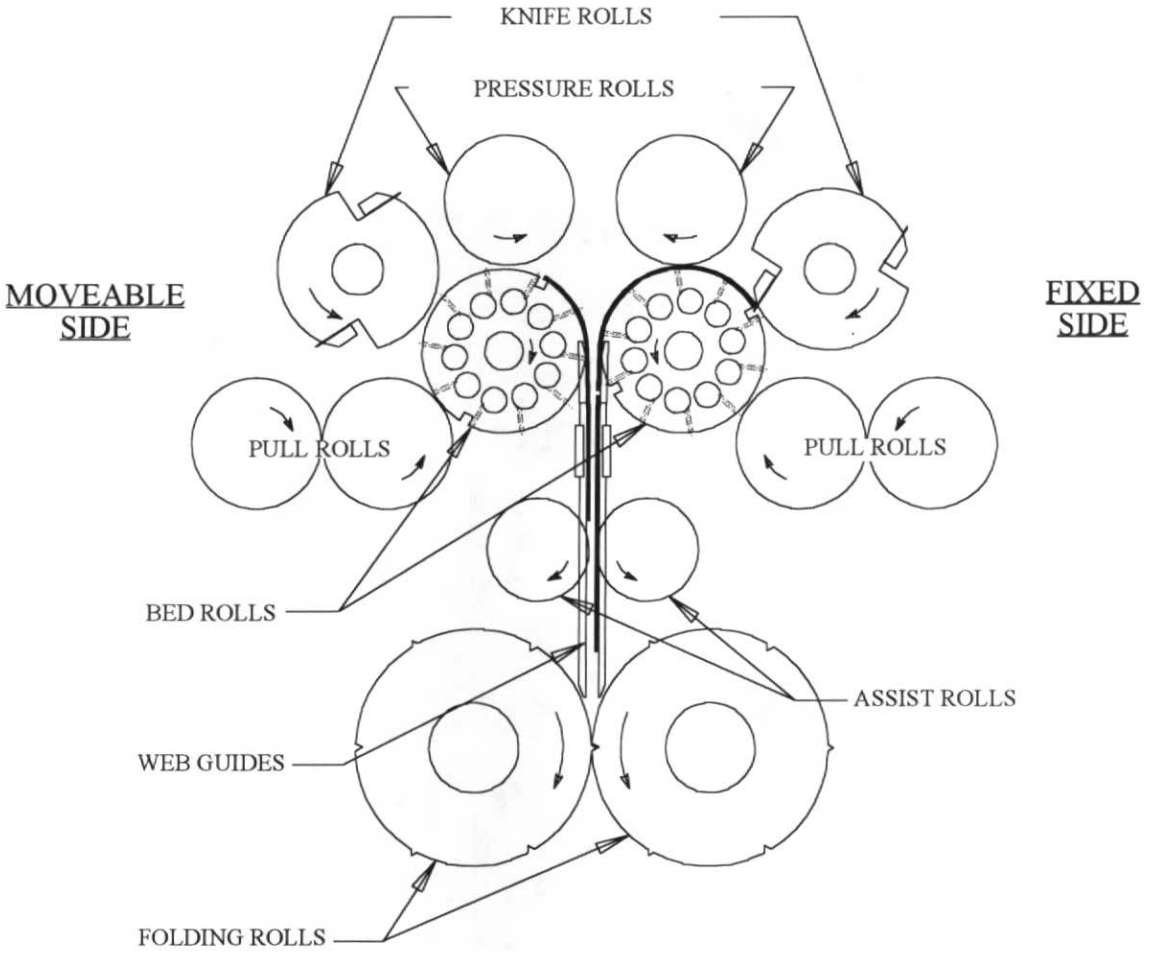
SINGLEFOLD INTERFOLDER
SEQUENCE OF OPERATION
SERRATED CUTOFF



Stage 3

After the sheet from the fixed side is cutoff by the knife roll, vacuum continues to transfer the sheet around the bed roll into the web guides. When half the sheet length is in the web guides, it is then overlapped by the leading edge of the sheet from the moveable side, which is also cutoff at this time.

SINGLEFOLD INTERFOLDER
SEQUENCE OF OPERATION
SERRATED CUTOFF



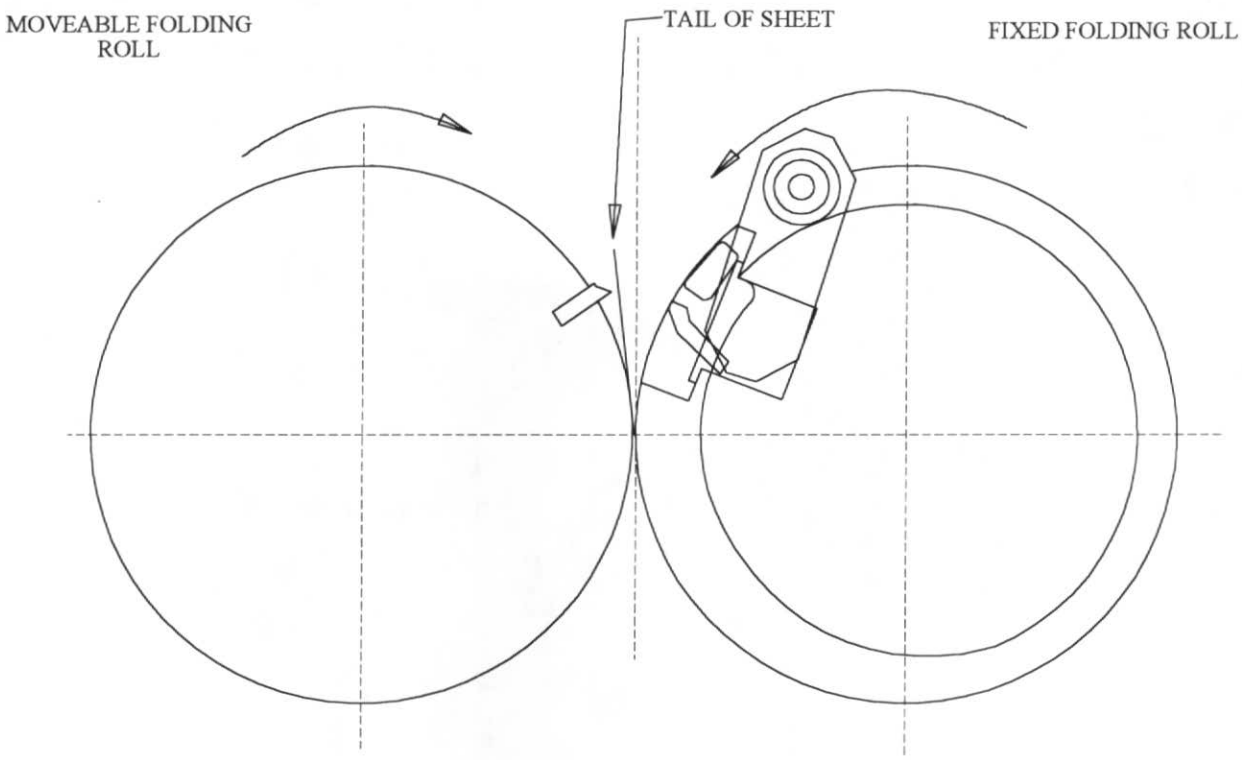
Stage 4

Once the overlapped sheets are fed into the assist rolls, the vacuum on the bed roll shuts off. Then the sheet continues in the web guides to the mechanical folding rolls.

Basic Folding Roll Interaction

Reference Sequence

View From Drive End



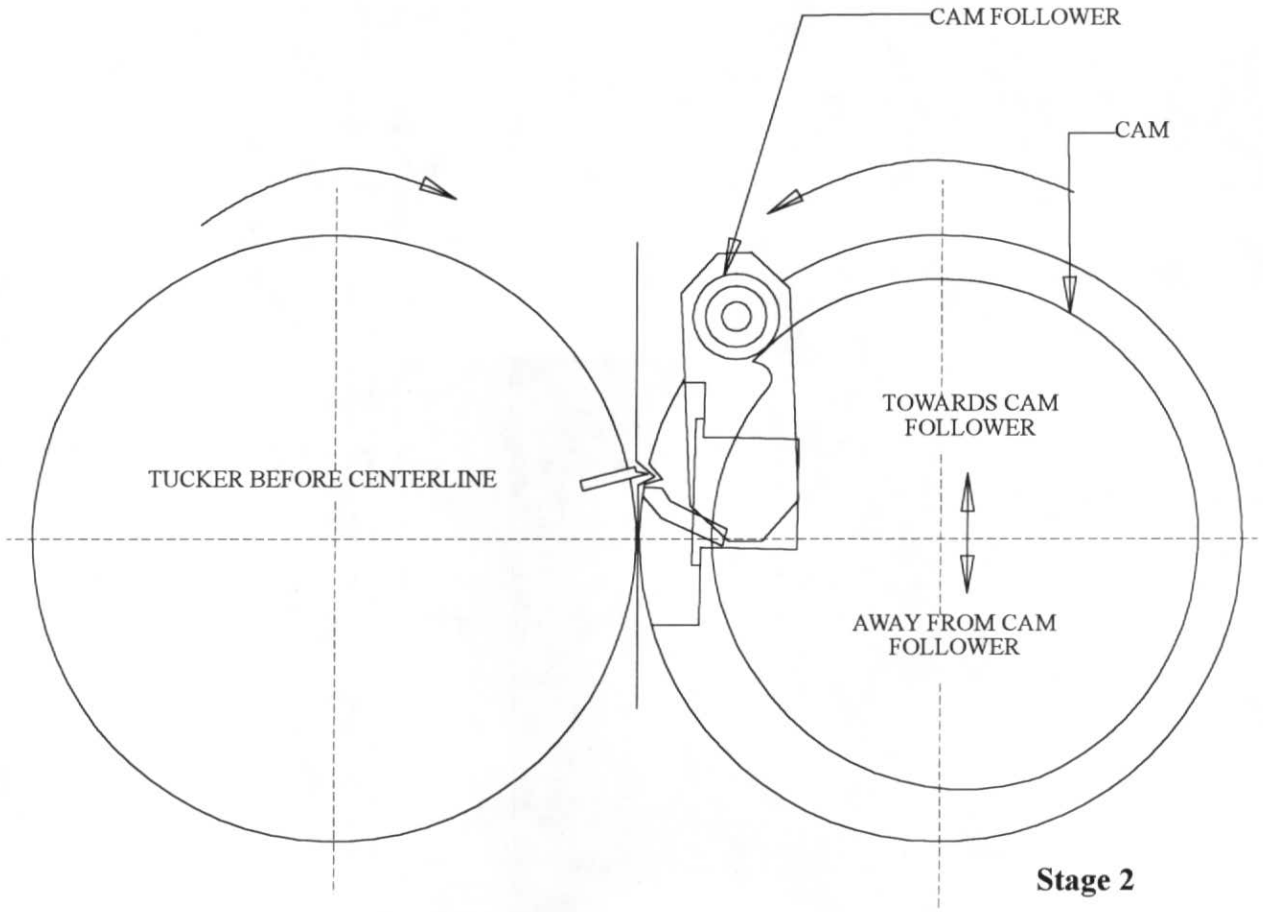
Stage 1

The folding rolls are in a position for the next tuck.

Basic Folding Roll Interaction

Reference Sequence

View From Drive End



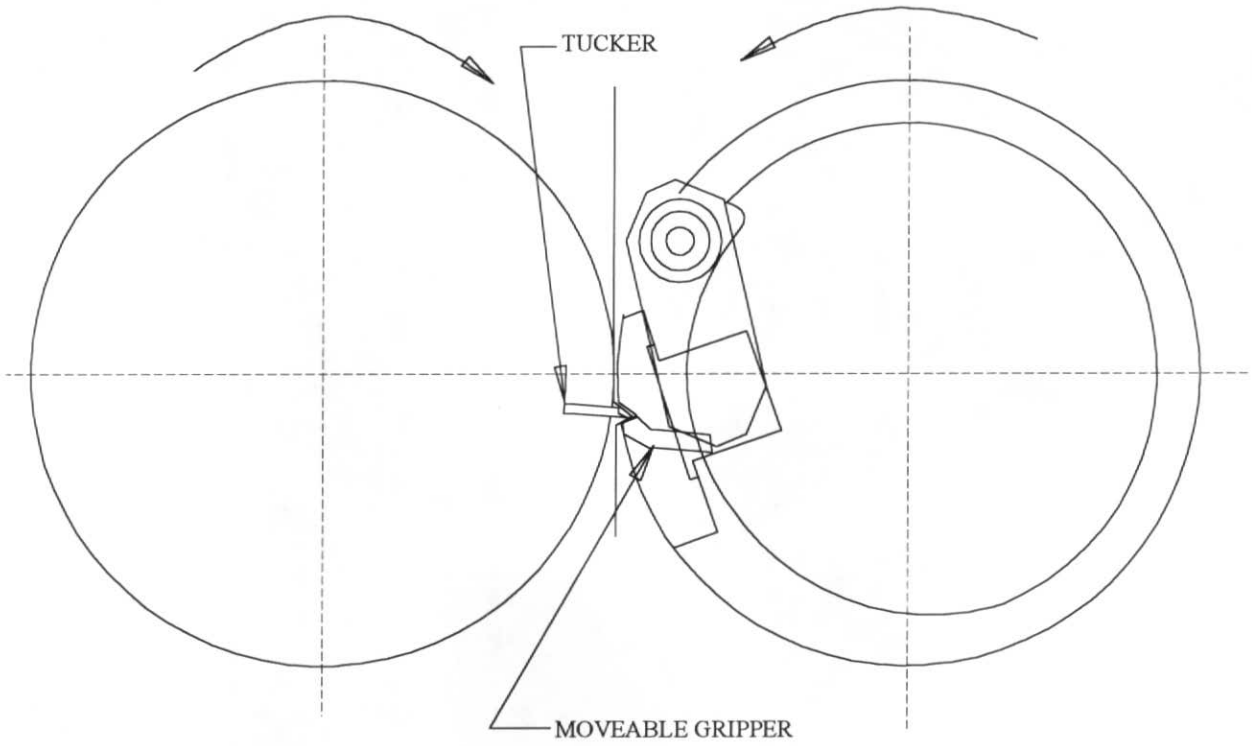
STAGE 2

The sheets have been tucked into the gripper. The cam timing for gripper closing is accomplished by turning the folding rolls to the desired position with the tucker before, on or after the center line. The best position is found by trial and error with the "on center line" position generally best. Turn the cam body away from the cam follower until it turns freely. Turn the cam body back to the cam follower until it just touches the cam follower.

Basic Folding Roll Interaction

Reference Sequence

View From Drive End



Stage 3

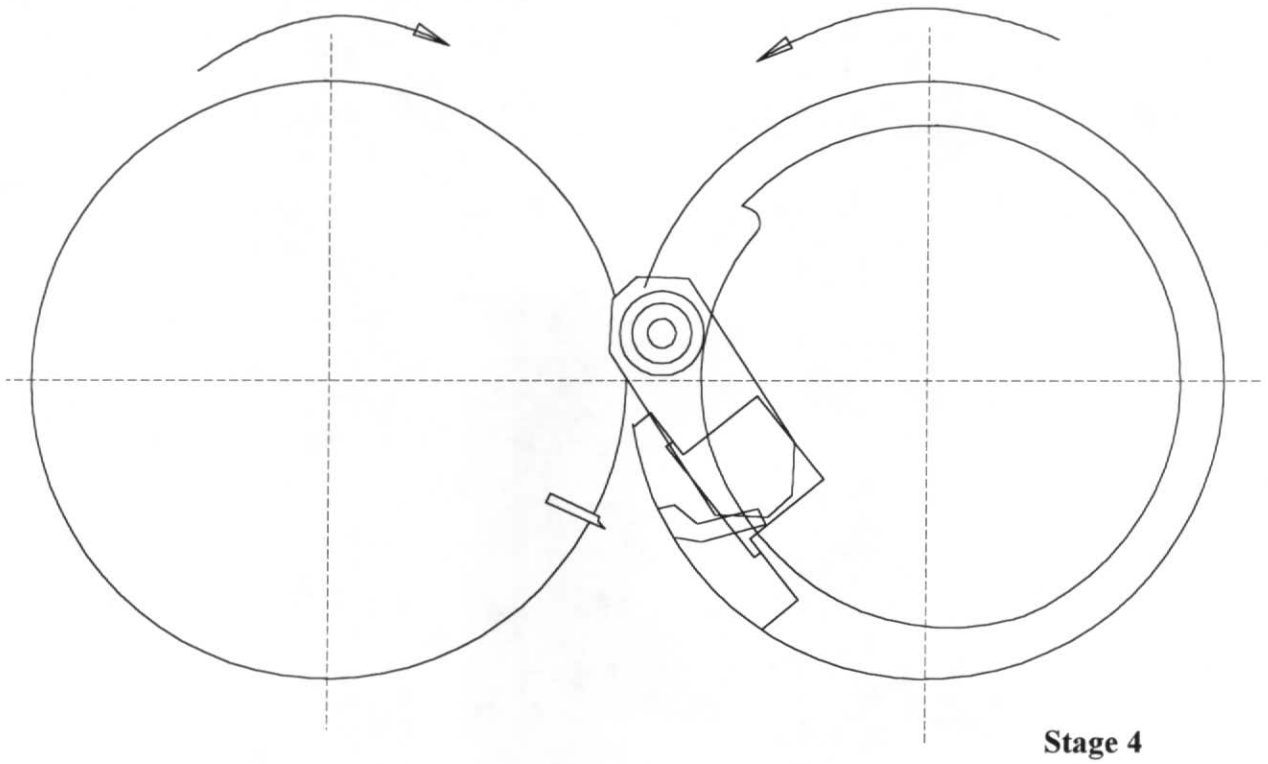
Stage 3

The moveable gripper is sliding down the face of the tucker. When it reaches the tip, the moveable gripper will close and grip the sheets.

Basic Folding Roll Interaction

Reference Sequence

View From Drive End



Stage 4

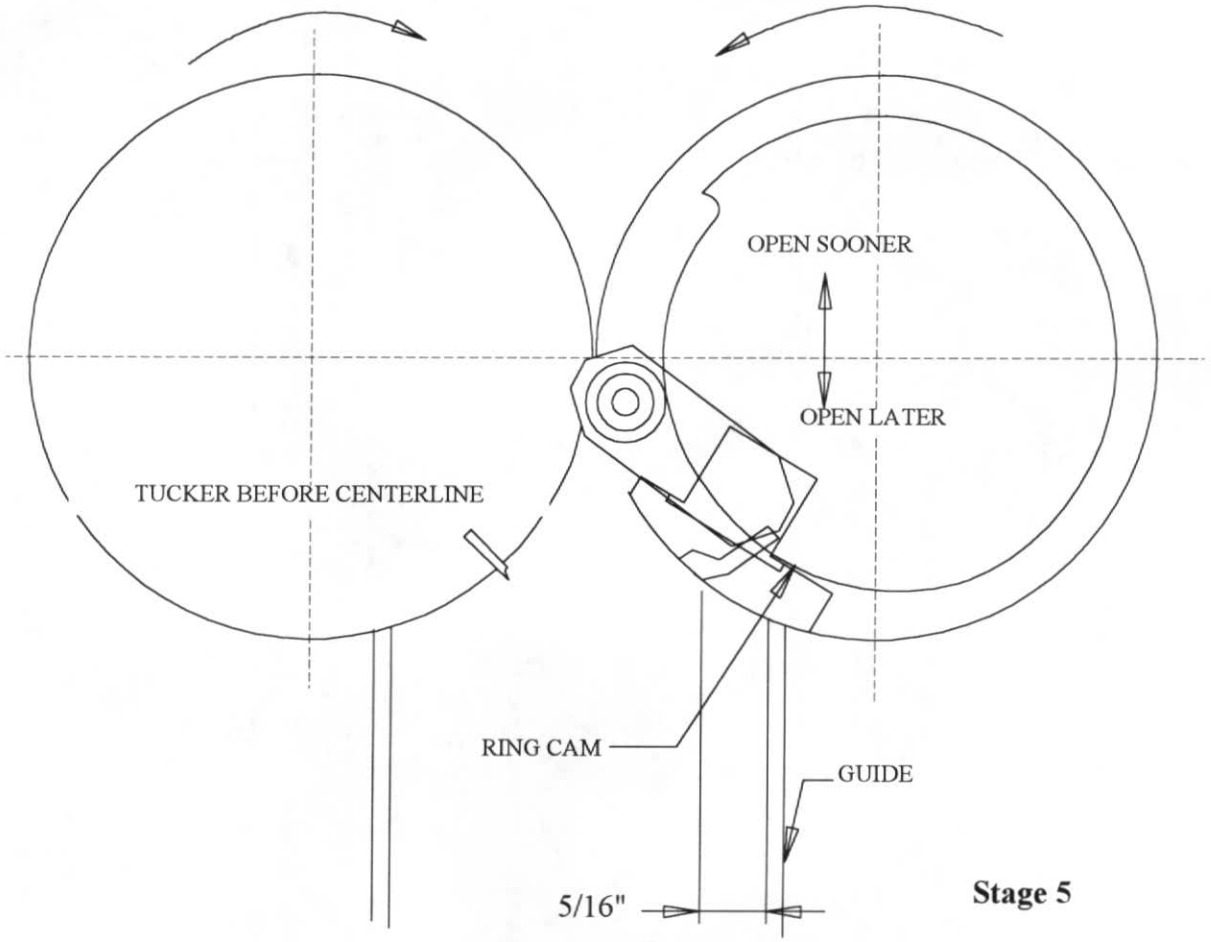
Stage 4

The moveable gripper has closed.

Basic Folding Roll Interaction

Reference Sequence

View From Drive End



Stage 5

The gripper must be opened approximately 5/16" before the guide. This is accomplished by rotating the ring cam until it just touches the cam follower. Both cam followers must be rotating freely before the ring cam is turned to the cam followers. (Refer to the Service Manual for proper setup of gripper opening. Also see the Folder Installation Drawing for the timing dial information).

Chapter 7 Press Table

Section A

Press Table Safety

Press Table Safety

Read and follow all safety instructions in the **GENERAL SAFETY** section of this manual.

General Safety

Caution!
No maintenance or service work should be performed on the machine without referring to the General Safety Section: "Maintenance and Servicing Equipment Shutdown Procedures" and "Restoring Equipment to Service Procedures" in Chapter 1 in this manual.

1) Know the locations of the *Emergency Stop* push-button.
2) Know the locations of all main air shut-off valves.
3) **Do not** reach into a running machine for any reason!
4) Stay clear of moving components.
5) **Do not** wear any loose clothing or jewelry that could get caught in moving parts.
6) Hair should not hang. It could impair vision or become caught in the machine.

Press Table Safety

1) Keep all guards in place. Never operate a machine with any of the guards off or open.
2) This machine was designed to be operated by one operator only. When there is more than one operator working on this machine, the risks of getting hurt increase.

Section B

Press Table Terminology

Press Table Terminology

WARNING!
THROUGHOUT THIS CHAPTER THE MACHINE IS SHOWN WITHOUT GUARDS FOR VIEWING PURPOSES ONLY! **DO NOT** OPERATE THE PRESS TABLE WITH THE GUARDS REMOVED OR OPEN!

Compression Plates (1):

The compression plate compresses the package to the desired height. It is activated by the compression cylinder.

Ejection Plunger (2):

It unloads the product off the compression plates after the operator has wrapped up the product and has pressed the photoeyes. It is activated by the unload cylinder.

Banner Opto-Touch Photoeyes (3):

The operator must activate these photoeyes at the same time for the cycle to start. This is a safety feature to keep the operator's hands free from the compression plates. Once the pack is compressed and banded, the operator activates these photoeyes in the same manner to complete the cycle.

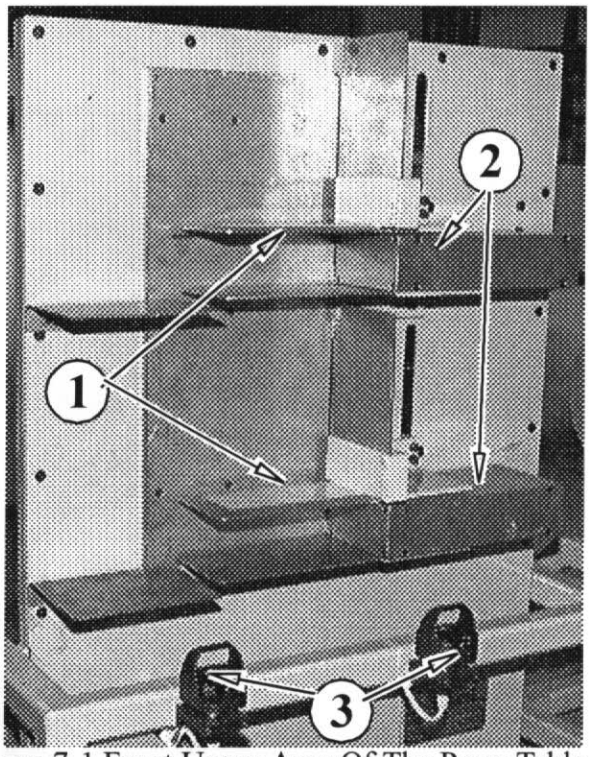


Figure 7-1 Front Upper Area Of The Press Table

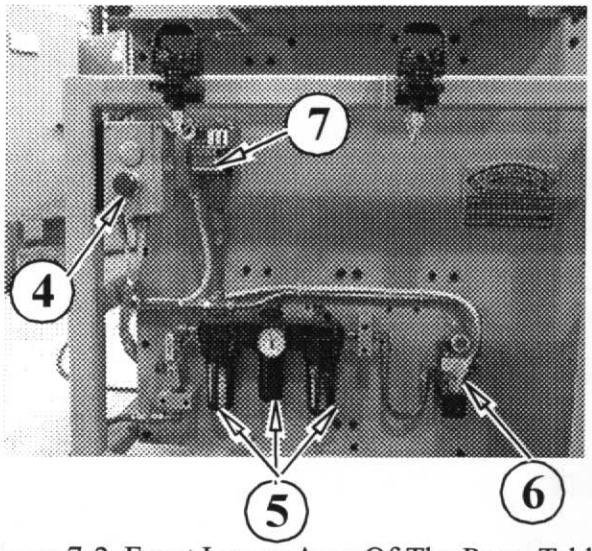


Figure 7-2 Front Lower Area Of The Press Table

E-Stop Push-Button (4):

When the E-Stop button is pressed, the cycle is stopped and the air to the press table is disabled. It also resets automatically the air to the press table.

Main Air Filter, Regulator And Lubricator (5):

It should be set at 70-80 psi.

Main Air Solenoid

It controls the air to the press table.

Pressure Switch

It should be set at 30 psi. If the pressure drops below the set point, the switch turns off and the press table does not run for lack of air pressure.

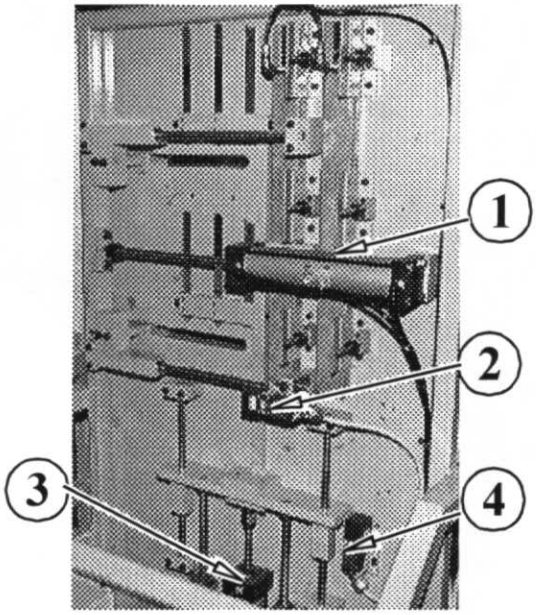


Figure 7-3 Rear Upper Area Of The Press Table

Unload Cylinder (1)

It pushes the ejection plunger out to unload the product. The operator has to press the photoeyes a second time to activate this cylinder.

Unload Cylinder Retracted Proximity Switch (2)

It indicates that the unload cylinder is fully retracted, which is the position where the unload cylinder has to be at for the compression cylinder to work.

Compression Cylinder (3)

It pushes the compression plates down to compress the package. It is activated when the operator presses the photoeyes for the first time.

Compression Cylinder Up Switch (4)

This switch indicates that the compression plates are fully compressing the package. When the compression cylinder is in this position, then the unload cylinder can push the product out.

Back Stop Solenoid (1)

When this solenoid is on, the product alignment plate moves forward and it is ready to receive product.

In the off position, the alignment plate move back allowing the ejection plunger to operate.

Compression Solenoid (2)

When this solenoid is on, the compression cylinder gets activated pushing the compression plates down.

In the off position, the compression plates come up.

Unload Solenoid (3)

In the on position, the unload cylinder pushed the ejection plunger out.

In the off position, the unload cylinder retracts.

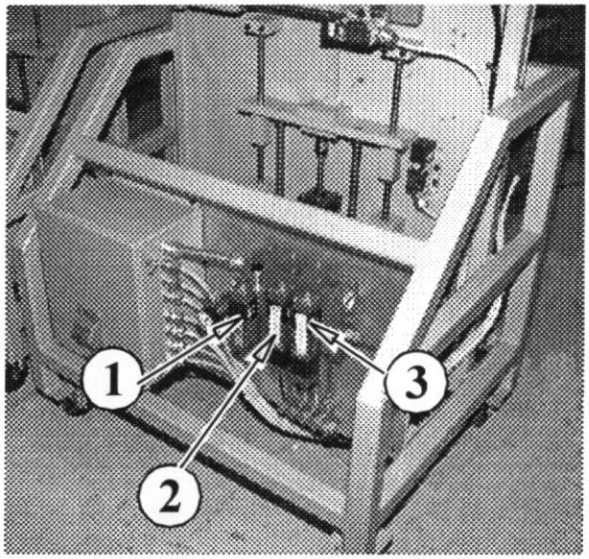


Figure 7-4 Rear Lower Area Of The Press Table

Section C

Press Table Operation

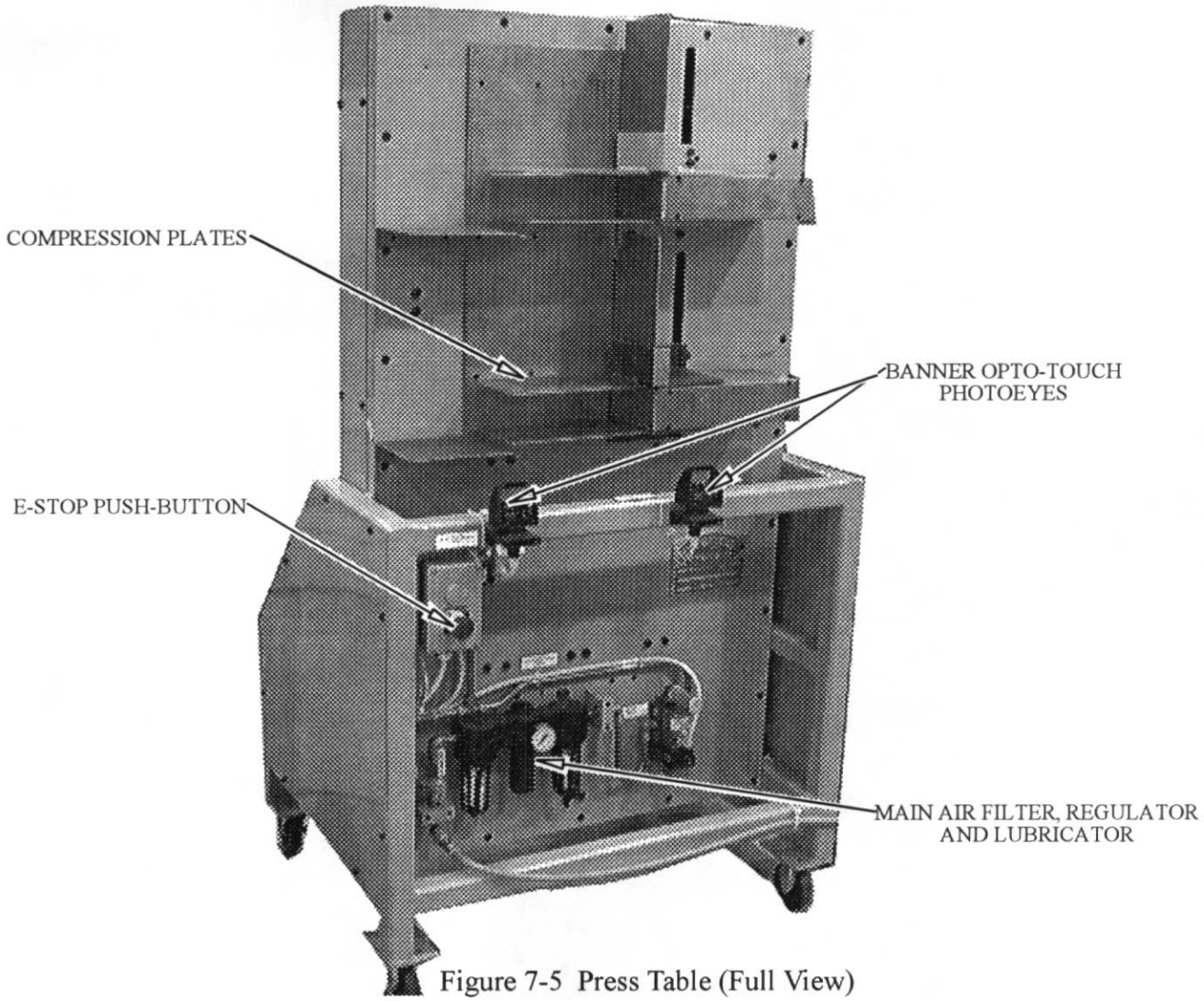


Figure 7-5 Press Table (Full View)

Press Table Operation

The press table cycle is started when the operator activates both of the Banner Opto-Touch Photoeyes. Both photoeyes must be activated within approximately 1/2 second of each other or the cycle will not start. Once the photoeyes have been activated the compression cylinder starts to compress the towel pack. At the same time the air to the unload cylinder is enabled. The operator must keep both of the Banner Opto-Touch Photoeyes activated until the pack is fully compressed or the cycle will stop and the compression cylinder will return to its starting position. After the pack is compressed, the operator places a sleeve around the pack. Once the pack is banded, the operator must again activate both of the Banner Opto-Touch Photoeyes, which will cause the unload cylinder to extend and unload the package. When the unload cylinder is fully extended, the automatic reset cycle limit switch is actuated. This will cause the unload cylinder to retract and will return the compression cylinder to its starting position ready for another cycle to begin.

If a problem or jam-up occurs at any time during the press table cycle, the operator must activate both of the Banner Opto-Touch Photoeyes. This will stop the cycle and return the unload and compression cylinders to their respective starting positions.

If an *Emergency Stop* push-button is pressed, the cycle is stopped and air to the press table is disabled. After clearing the problem the operator must reset the *Emergency Stop* button, which will re-enable the air and power to the press table. The operator can then safely restart the cycle again.

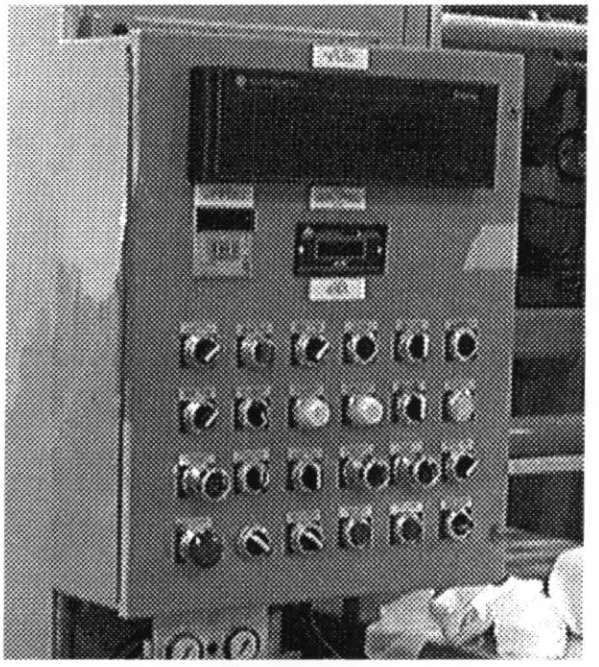
Chapter 8 Push-Buttons

Section A

Operator's Push-Button Controls

Operator's Push-Button Control Station

Serial Number 5285-96 PZ3



Mounted On Main Panel

Star Wheel Trim Control

This potentiometer controls the speed of the star wheels. This potentiometer is dependant upon the speed at which the main drive is set; that is, the main drive needs to be running. If the speed of the star wheels is too slow, the towels will back up into the folding roll. If the speed is too fast, the delivery will be poor.

Tray Belts Trim Control

This potentiometer controls the speed of the tray belt. This potentiometer is dependant upon the speed at which the main drive is set; that is, the main drive needs to be running. If the speed of the tray belts is too slow, the towels will back up into the folding roll. If the speed is too fast, the delivery will be poor.

Front Stand Lateral Register Opp./Drive (3-Position Spring Return To Center Selector Switch)

This selector switch is used to adjust the lateral register, lining up the center of the webs with the center of the folder. *Drive* moves the roll toward the drive side and *Opp.* moves the roll towards the operator's side of the machine.

Rear Stand Lateral Register Opp./Drive (3-Position Spring Return To Center Selector Switch)

This selector switch is used to adjust the lateral register, lining up the center of the webs with the center of the folder. *Drive* moves the roll toward the drive side and *Opp.* moves the roll towards the operator's side of the machine.

Counter Off/On (2-Position Selector Switch)

This selector switch turns off or on the Omron counters. In the *Off* mode, this switch shuts off the Omron counters as well as the air to the count solenoids. In the *On* mode, this switch turns on the air to the count solenoids and the Omron counters.

#1 Jog (Yellow Push-Button)

This push-button is used with the *Jog/Run* selector switch, for threading or clearing a jam. To jog the machine, turn the *Jog/Run* selector switch to the *Jog* position and push the *Jog* button, (at the same station, also see *Jog/Run*). A warning horn sounds each time the *Jog* button is pushed and the machine will begin to turn over slowly. **NOTE**: Be sure to place the *Jog/Run* selector switch back into the *Run* position when finished jogging.

Machine Reset (Amber Illuminated Push-Button)

This push-button applies power to the circuit that constantly monitors the correct functioning of the hard wired *E-Stops* until this button is pressed, no control power is available to any critical area of the machine. The amber light indicates the status of the circuit. Pushing the *Machine Reset* once quickly will bring up the I/O power, the amber light will flash. Pushing and holding the *Machine Reset* button will bring up the I/O power and completely reset the machine. The horn sounds a number of times, then any faults on the machine are cleared and air to the machine comes up. If the *Emboss Load/Unload* selector switch is not in the *Unload* position, it will try to load. If all systems reset properly, the *Machine Reset* light will illuminate solid.

Remote Vacuum Pump Start (Red Illuminated Push-Button)

This push-button is used to start the vacuum pump. This button must be pushed in and held in until the red light comes "On". The *Remote* button is mounted on the folder main operator station.

Vacuum Pump Local Selected (White Pilot Light)

This light indicates that the *Vacuum Start Remote/Local* selector switch is in the *Local* position and the vacuum pump must be started from the *Local* station.
NOTE #1: The *Local* station is located on the vacuum pump control cabinet.
NOTE #2: The vacuum pumps will not start from the *Local* station if the *Vacuum Start Remote/Local* selector switch is in the *Remote* position. The vacuum pumps will not start from the *Remote* station if the *Vacuum Start Remote/Local* selector switch is in the *Local* position.

Machine Start (Red Illuminated Push-Button)

This push-button starts the main drive. A warning horn sounds first, before the folder begins to turn over. this push-button must be held in until a sufficient oil flow in the folder gear case has been reached. If not held in long enough, the machine coasts to a stop. Red indicator light "On" signifies sufficient oil pressure.

#1 Jog/Run (2-Position Selector Switch)

In the *Jog* position, this switch allows the operator to jog the machine over for the purposes of threading or clearing a jam. The *Jog* mode is used in conjunction with the *Jog* push-button.
NOTE #1: The operator cannot place the *Jog/Run* selector switch into the *Jog* position at one station and then jog the machine over from another station. In the *Run* position, the machine is ready to run.
NOTE #2: All *Jog/Run* selector switches must be in the *Run* position in order to run the machine. The machine will not run if any *Jog/Run* selector switches are in the *Jog* position.

#1 Emergency Stop (Red Push-Pull Button)

This button stops the folder main drive and engages the main drive brake as well as the unwind stand brakes. It also shuts down many of the electrical and pneumatic systems.
NOTE: The *E-Stop* button that is used to shut down the machine must be reset before the machine can be restarted.

Remote Vacuum Pump Stop (Red Extended Head Push-Button)

This push-button is used to shut down the vacuum pump. The "Remote" button is mounted on the folder main operator station.

#1 Machine Stop (Red Extended Head Push-Button)

This push-button brings the machine to a slow coasting stop. It does not shut down the electrical or pneumatic systems like the Emergency Stop.

Main Drive Speed Control (Potentiometer)

This potentiometer controls the speed of the folder. The folder starts out slowly and accelerates to the speed that the potentiometer is set at.

Folder Decks Disengage/Engage (3-Position Amber Illuminated Selector Switch)

In *Disengage* mode the lockup circuits release the lock-up air cylinder.

When turned to *Engage* the air cylinders automatically engage when the proximity switch is made.

Message Display English/Spanish (2-Position Selector Switch)

This selector switch controls which language appears on the Dataliner Display.

Fault Message Recall (Black Push-Button)

This push-button allows the operator to recall the fault message that caused the shutdown of the machine.

Low Roll Acknowledge (Black Push-Button)

This push-button is used by the operator to acknowledge the fact of a low parent roll. When pressed, this push-button turns off the low roll blue flashing light.

Thread Assist Off/On (2-Position Selector Switch)

In the *On* position, the vacuum to the bed roll is turned on to pick up the sheet earlier for threading the folding head.
The *Off* position is the normal running condition.

Emboss Unload/Load (Selector Switch -3 Position Spring Loaded From Right)

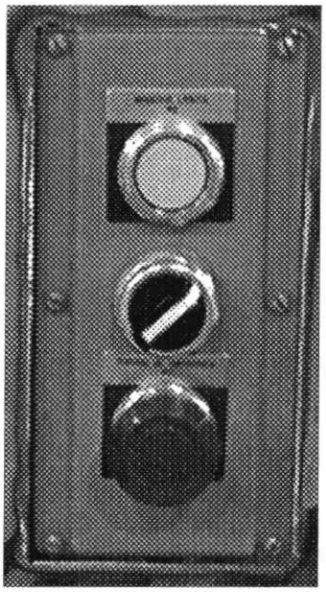
This switch controls the air supply to the FIRESTONE air donuts for engaging the die rolls. In the *Unload* mode, air is released from the air donuts forming a 3/16" gap between the die rolls. This gap facilitates threading paper through the rolls and removing wrap-ups.
Note: The rolls will not disengage enough to cause the gears to become out of mesh and lose emboss pattern registration.
In the *Load* mode, the air donuts fill with air to load the die rolls into position to emboss the paper web.

Emboss Rolls Loaded (White Indicator Light)

This light turns on when the air bags are loaded and the embossing rolls are engaged. This is the normal running position.

It turns off when the *Emboss Unload/Load* selector switch is in the *Unload* mode.

Folder Jog Station (Front And Rear Of Folder)



#2, #3 Jog (Yellow Push-Button)

This push-button is used with the *Jog/Run* selector switch, for threading or clearing a jam. To jog the machine, turn the *Jog/Run* selector switch to the *Jog* position and push the *Jog* button, (at the same station, also see *Jog/Run*). A warning horn will sound each time the *Jog* button is pushed and the machine will begin to turn over slowly. **NOTE**: Be sure to place the *Jog/Run* selector switch back into the *Run* position when finished jogging.

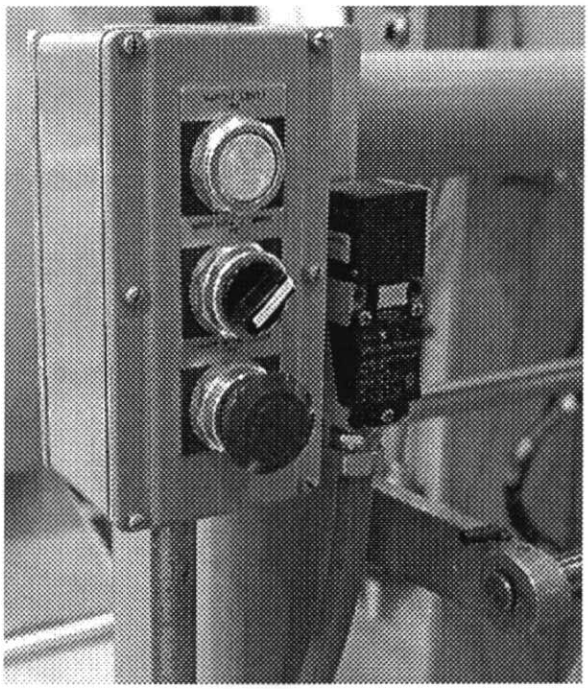
#2, #3 Jog/Run (2-Position Selector Switch)

In the *Jog* position, this switch allows the operator to jog the machine over for the purposes of threading or clearing a jam. The *Jog* mode is used in conjunction with the *Jog* push-button.
NOTE #1: The operator cannot place the *Jog/Run* selector switch into the *Jog* position at one station and then jog the machine over from another station. In the *Run* position, the machine is ready to run.
NOTE #2: All *Jog/Run* selector switches must be in the *Run* position in order to run the machine. The machine will not run if any *Jog/Run* selector switches are in the *Jog* position.

#2, #3 Emergency Stop (Red Push-Pull Button)

This button stops the folder main drive and engages the main drive brake. It also shuts down many of the electrical and pneumatic systems.
NOTE: The *E-Stop* button that is used to shut down the machine must be reset before the machine can be restarted.

Dancer Unit Jog Station



#4 Jog (Yellow Push-Button)

This push-button is used with the *Jog/Run* selector switch, for threading or clearing a jam. To jog the machine, turn the *Jog/Run* selector switch to the *Jog* position and push the *Jog* button, (at the same station, also see *Jog/Run*). A warning horn sounds each time the *Jog* button is pushed and the machine starts to turn over slowly. **NOTE**: Be sure to place the *Jog/Run* selector switch back into the *Run* position when finished jogging.

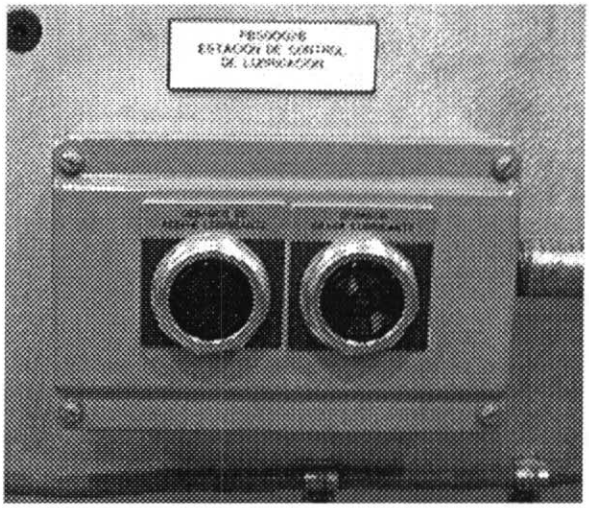
#4 Jog/Run (2-Position Selector Switch)

In the *Jog* position, this switch allows the operator to jog the machine over for the purposes of threading or clearing a jam. The *Jog* mode is used in conjunction with the *Jog* push-button.
NOTE #1: The operator cannot place the *Jog/Run* selector switch into the *Jog* position at one station and then jog the machine over from another station. In the *Run* position, the machine is ready to run.
NOTE #2: All *Jog/Run* selector switches must be in the *Run* position in order to run the machine. The machine will not run if any *Jog/Run* selector switches are in the *Jog* position.

#4 Emergency Stop (Red Push-Pull Button)

This button stops the folder main drive and engages the main drive brake. It also shuts down many of the electrical and pneumatic systems.
NOTE: The *E-Stop* button that is used to shut down the machine must be reset before the machine can be restarted.

Lube. Operator Station (Mounted On Lube. Plate)



Oil Lube Primer (Black Push-Button)

This push-button operates the LINCOLN lubrication pump for suppling oil to the machine. The pump will cycle once each time the button is pressed.

Grease Lube Primer (Black Push-Button)

This push-button operates the LINCOLN lubrication pump for suppling grease to the machine. The pump will cycle once each time the button is pressed.

Vacuum Pump Operator Station

Macine Running (Green Pilot Light)

This light is "On" while the machine is running.

Vacuum Start Remote/Local (2-Position Selector Switch)

This selector switch allows the vacuum pump to be started from either the *Remote* location (the *Remote* buttons are mounted on the Folder Operator Station) or from the *Local* location (the *Local* buttons are mounted on the Vacuum Pump Enclosure).
NOTE: The vacuum pump will not start from the *Local* station if this selector switch is in the *Remote* position. The vacuum pump will not start from the *Remote* station if this selector switch is in the *Local* position.

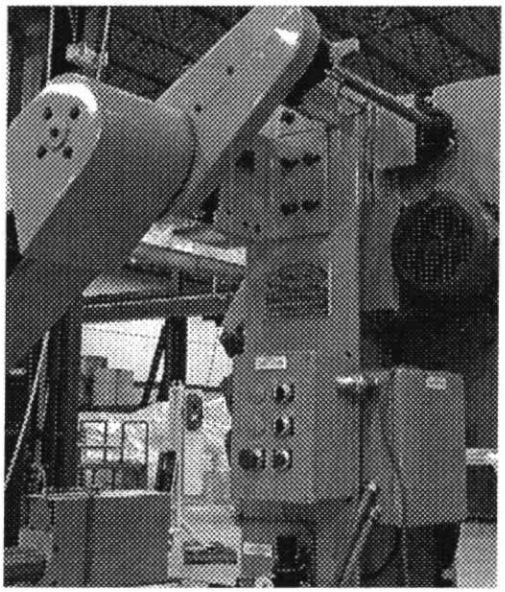
Local Vacuum Start - (Red Illuminated Push-Button)

This push-button is used to start the vacuum pumps. The *Local* push-button is mounted on the vacuum pump enclosure. This button must be held in until the light comes on and stays on.

Local Vacuum Stop - (Red Extended Head Push-Button)

This push-button is used to shut down the vacuum pumps. The *Local* push-button is mounted on the vacuum pump enclosure.

Unwind Stand Operator Station (Front and Rear)



Low Roll Acknowledge (Black Push-Button)

This push-button is used by the operator to acknowledge the fact of a low parent roll. When pressed, this push-button turns off the low roll blue flashing light.

Front/Rear Unwind Belt Arm Up/Down (3-Position Spring Return To Center Selector Switch)

In the *Up* mode, the belt drive arm is raised up.
In the *Down* mode the belt drive arm is lowered.

Front/Rear Unwind Turret Lock/Unlock (3-Position Selector Switch)

This selector switch controls (2) air cylinders:
(1) "Spindle Support Cylinder'
(2) "Turret Stand Lock-up Pin Cylinder.
In the *Lock* mode, the turret stand lock-up pin cylinder *extends*, locking the turret stand body in place. At the same time the spindle support cylinder, mounted on the outboard supports, are retracted, which moves the spindle support into place, supporting the end of the turret spindle.
In the *Unlock* mode, the turret stand lock-up pin cylinder *retracts*, allowing the turret stand body to move freeely. At the same time the spindle support cylinder, mounted on the outboard supports, are extended, which moves the spindle support away from the end of the turret spindle.

#2 Machine Stop (Red Push-Button)

This push-button brings the machine to a slow coasting stop. It does not shut down the electrical or pneumatic systems like the Emergency Stop.

#5 Emergency Stop (Red Extended Head Push-Pull Button)

This button stops the folder main drive and engages the main drive brake. It also shuts down many of the electrical and pneumatic systems.
NOTE: The *E-Stop* button that is used to shut down the machine must be reset before the machine can be restarted.

Operator Controls Found On The Main Control Cabinet

Omron Counters

These counters are used to set up the cycle times of the "Lincoln" lubrication system pumps. There is one counter for each system.

Machine Status Stack Light

Machine Armed (Amber Light)

This light indicates that the machine is *ready* to *run* or *jog*. This condition indicates that it is not safe for maintenance or another personnel to work on the machine. I/O Power is turned on. The program controllers are capable of making machinery motion.

Maintenance Call (Blue Light)

This light indicates that maintenance is required. It lights when a low parent roll condition exists.

Section B

Message Descriptions

Message List

Serial Number 5285-96 PZ3

The following messages and a brief list of possible causes and solutions for correcting the faults can appear on the ALLEN-BRADLEY Dataliner display. Most faults shut down the machine. Faults must be corrected before restarting the machine.

After the main disconnect switch was turned *"on"*, the A-B Dataliner display runs a self-test to check if the operating systems work right. After this self-test the Dataliner display flashes messages showing the time and date and any faults or other messages needed to start the machine.

The operator can also push the *Fault Message Recall* button to call up the fault message from the main operator control panel. Also see "Operator Controls" in this manual.

NOTE: Messages are listed alphabetically. Messages of machine faults can occur in any sequence.

#	MESSAGE DESCRIPTION
	A
32	AIR OVERRIDE ON This message indicates that the main air solenoid has been manually overridden. To clear this message, remove the device used for the manual override.
	B
117	BRAKE PRESSURE LOW This message indicates that an insufficient air pressure has been detected in the emergency stop brake pneumatic circuit. To clear this message, check the air supply and pressure switch. Adjust the pressure switch if necessary or replace if defective. Push the *Machine Reset* push-button and continue with normal start-up procedures. **CAUTION**: When working with high pressure air couplings!
	D
7	DISPLAY BATTERY LOW This message indicates that the A-B Dataliner Display battery needs to be replaced. To clear this message, replace the A-B Dataliner Display batteries. **Note**: Refer to the A-B Dataliner Display Manual for quantity, type and replacement procedure. **CAUTION**: This work should be performed by properly trained electrical personnel only.
96	#1 DRIVE STOP These messages indicate that a *Drive Stop* push-button was used to shut down the machine. To clear these messages, push the *Drive Start* push-button.
97	#2 DRIVE STOP
140	DRIVE RUN RELAY FAILURE This message indicates that the drive run relay has failed. To clear this message, replace the drive run relay. **DANGER:** High Voltages! This work should be performed by properly trained electrical personnel only.
141	DRIVE JOG RELAY FAULT This message indicates that the drive jog relay has failed. To clear this message, replace the drive jog relay. **DANGER**: High Voltages! This work should be performed by properly trained electrical personnel only.
50	#1 FOLDER GUARD DOOR This message indicates that a guard door in the folder area is open. To clear this messages, close the guard door. **CAUTION**! **Do not** operate the machine with guard doors open or guard panels removed from the machine!
51	#2 FOLDER GUARD DOOR
52	#3 FOLDER GUARD DOOR
53	#4 FOLDER GUARD DOOR

#	MESSAGE DESCRIPTION
54	#5 FOLDER GUARD DOOR
55	#6 FOLDER GUARD DOOR
56	#7 FOLDER GUARD DOOR
57	#8 FOLDER GUARD DOOR
58	#9 FOLDER GUARD DOOR
59	#10 FOLDER GUARD DOOR
60	#11 FOLDER GUARD DOOR
61	#12 FOLDER GUARD DOOR
62	#13 FOLDER GUARD DOOR
63	#14 FOLDER GUARD DOOR
64	#15 FOLDER GUARD DOOR
65	#16 FOLDER GUARD DOOR
	E
11	#1 EMERGENCY STOP These messages indicate that one of the *E-Stop* buttons located on the machine has been pushed in. To clear these messages, pull out the *E-Stop* buttons. **Note #1**: All other *E-Stop* buttons function the same way. **Note #2**: The *E-Stop* button that was used to stop the machine must be reset before the machine can be restarted. (Also see the Operator's Push-button Control write-up).
12	#2 EMERGENCY STOP
13	#3 EMERGENCY STOP
14	#4 EMERGENCY STOP
15	#5 EMERGENCY STOP
16	#6 EMERGENCY STOP
36	EMBOSS WRAP-UP These messages indicate that a jam-up or wad-up has occurred in the embossing roll. To clear these messages, the wrap-up must be removed allowing the proximity switch to reset. **CAUTION**: When working around any roll nips!
78	ELS NOT READY-REAR UNWIND STAND The rear unwind stand ELS controller has not responded to the run or jog command. Check the controller for a fault indication and refer to the Saftronics Operation Manual for a description of the fault. Try to restart the machine. If the problem persists, verify the wiring before replacing drive components.
79	ELS NOT READY-FRONT UNWIND STAND
80	ELS NOT READY-STARWHEEL
81	ELS NOT READY-TRAY BELTS

#	MESSAGE DESCRIPTION
	F
37	REAR FOLDER PULL ROLL WRAP-UP These messages indicate a jam-up or wad-up at the folder pull roll assembly. To clear these messages, remove the wrap-up and allow the proximity switch to reset. Re-thread the folder if necessary. Possible causes of the wrap-up are: 1) Low vacuum 2) Lack of tension between embosser and folder If after clearing the jam or if error condition still persists with no wrap-up, check the adjustment of the "pull roll wrap" limit switches.
38	FRONT FOLDER PULL ROLL WRAP-UP These messages indicate a jam-up or wad-up at the folder pull roll assembly. To clear these messages, remove the wrap-up and allow the proximity switch to reset. Re-thread the folder if necessary. Possible causes of the wrap-up are: 1) Low vacuum 2) Lack of tension between embosser and folder If after clearing the jam or if error condition still persists with no wrap-up, check the adjustment of the "pull roll wrap" limit switches.
67	FOLDER DECKS OPEN The machine shut down because the folder deck was open. One half of the folder frame is mounted on a rack-and- pinion so that it can be moved away from the other half for maintenance purposes. The folder frame must be closed and locked into position in order to run. NOTE: while closing the frames, ensure that the folding rolls are mechanically timed and you achieved proper gear mesh.
95	FOLDER DRIVE CLUTCH OVERLOAD The folder is equipped with an overload clutch to prevent damage to the rolls in the event of a jam. Clear all jams and inspect folder for obstructions. Manually reset the clutch. After resetting the clutch, manually turn the folder over at least one full revolution of the folding rolls. While the machine may be difficult to turn over by hand, no solid resistance should occur. If solid resistance does occur, check folding head for foreign objects and completely inspect gear train for obstructions.
100	FRONT FOLDER WEB BREAK These messages indicate that a broken web has been detected at the front folder. To clear these messages, thread the broken web back into the folder. **CAUTION** : When threading the machine. **Note**: A false web break indication is normally triggered by a hole in the web.
102	REAR FOLDER WEB BREAK These messages indicate that a broken web has been detected at the rear folder. To clear these messages, thread the broken web back into the folder. **CAUTION** : When threading the machine. **Note**: A false web break indication is normally triggered by a hole in the web.
111	FOLDER LOW OIL This message indicates that the oil in the Lincoln automatic lubrication reservoir is getting low. To clear this message, refill the oil reservoir. Note: Check the lubrication charts.
112	FOLDER LOW GREASE This message indicates that the grease level in the Lincoln automatic lubrication reservoir is getting low. To clear this message, refill the grease reservoir. **Note**: Check the Lubrication Charts.

#	MESSAGE DESCRIPTION
	J
21	#1 JOG-RUN IN JOG These messages indicate that one of the *Jog/Run* selector switches located on the machine are in the *Jog* mode and that the machine can be jogged from that station. To clear this message, turn the *Jog/Run* selector switch to the *Run* mode. **Note #1**: All other *Jog/Run* selector switches function the same way. **Note #2**: The operator cannot place a selector switch into the *Jog* mode at one station and jog the machine over from another station. **Note #3**: All *Jog/Run* selector switches must be in the *Run* mode in order to run the machine.
22	#2 JOG-RUN IN JOG
23	#3 JOG-RUN IN JOG
24	#4 JOG-RUN IN JOG
25	#5 JOG-RUN IN JOG
	K
47	FRONT KNIFE JAM The machine shut down because of a knife roll wrap up. Clear the wrap-up. When safe, make the machine operational. Maintain the web. Perform a machine reset by pressing the *Machine Reset* button on the main operator's console and continue with normal start-up procedures. Source receiver photo eye *Rear Knife Roll Jam* has dropped out. If clearing the jam does not correct the problem, clean lenses on the source and receiver photo eyes. If the problem persists, check the alignment of source and receiver. As a last alternative, begin replacing photo eye parts. Possible causes of a knife roll jam include: 1)Low vacuum 2)Too wide of a pressure roll gap 3)Slack web tension between unwind stand and folder 4)Worn out knife
48	REAR KNIFE JAM
	L
30	LOSS OF VACUUM This message indicates that there is not sufficient vacuum to the folder to operate the machine. To clear this message, check that the vacuum pumps are running and that the filter screens, if present, are not obstructed.
113	LOW LUBE SHUTDOWN If the machine oil, grease and mineral oil pumps cycle several times after a this message has been displayed, the machine will shut down. The machine cannot run with critically low lubrication levels. To clear this message refill the machine reservoirs. **Note**: Check the Lubrication Charts.
	M
6	MACHINE OK This message indicates that no faults or errors have been detected, and that the machine is ready to run.
5	MACHINE RUNNING This message indicates that the machine is running and no faults or errors have been detected.

#	MESSAGE DESCRIPTION
49	MAIN DRIVE MOTOR FAULT This message indicates that the main drive motor has faulted. Determine the cause of the fault by referring to the Saftronics Operation Manual for a description of the fault. It is normal to get a main drive fault when an E-Stop is pushed or the machine enable relay turns off. Then, this message can be disregarded.
66	MISPLACED WRENCH The ratchet wrench used to manually turn over the machine is not in its assigned storage location. Locate the wrench and store properly. The machine will not run or jog until the wrench is replaced in its holder. When replaced, continue with normal start-up procedures.
77	MACHINE IS RESETTING
138	MAIN DRIVE ISOLATION TRANSFORMER THERMAL The main drive isolation transformer has overheated. Allow the transformer to cool and try to determine the cause of the overheating before restarting the machine.
	P
8	PLC BATTERY LOW This message indicates that the PLC (Programmable Logic Controller) battery needs to be replaced. To clear this message, replace the PLC batteries. **Note**: Refer to the PLC Manual for quantity, type and replacement procedure. **CAUTION**: This work should be performed by properly trained electrical personnel only.
143	PUSH MACHINE RESET This message indicates to the operator that a *Machine Reset* should be performed to re-enable the main output power to the machine. To clear this message, push the *Machine Reset* push-button.
	R
39	RESET EMBOSS This message indicates that the emboss is unloaded and must be reset. The emboss may be reset by pushing the *Machine Reset* push-button until the light is solid or by selecting *Load* on the *Emboss Unload/Load* selector switch.
	S
29	2 STATIONS IN JOG This message indicates that two *Jog/Run* selector switches on the machine are in the *Jog* mode. To clear this message, check each jog station and switch all the *Jog/Run* selectors switches to the *Run* mode. **Note**: The machine will jog from one and only one jog station at a time, if more than one jog station have the *Jog/Run* selector switches in the *Jog*, then all modes of operation are disabled.
73	FRONT STAND ROLL LOW This message indicates that a low roll switch on one of the unwind stands has been tripped. The machine may or may not shut down, depending upon customer preference. To clear this message, change the parent roll, allowing the low roll switch to reset.
75	REAR STAND ROLL LOW This message indicates that a low roll switch on one of the unwind stands has been tripped. The machine may or may not shut down, depending upon customer preference. To clear this message, change the parent roll, allowing the low roll switch to reset.

#	MESSAGE DESCRIPTION
42	FRONT STAND BELT ARM UP These messages indicate that the front stand belt drive arm on the unwind stand is up. The machine can be jogged in this condition, but the machine can not be run with any of the belt drive arms up. To clear these messages, make sure all of the belt drive arms are down, before pressing the *Machine Reset* button and restarting the machine.
44	REAR STAND BELT ARM UP These messages indicate that the rear stand belt drive arm on the unwind stand is up. The machine can be jogged in this condition, but the machine can not be run with any of the belt drive arms up. To clear these messages, make sure all of the belt drive arms are down, before pressing the *Machine Reset* button and restarting the machine.
70	SLITTERS DISENGAGED The machine will not run if the slitters are disengaged. Engage the slitter by selecting *Engage* on the *Slitter Engage/Disengage* selector switch.
	T
85	FRONT TURRET WEB BREAK This message indicates that the web has broken at the front turret stand. To clear this message, re-thread the web through the machine.
87	REAR TURRET WEB BREAK This message indicates that the web has broken at the rear turret stand. To clear this message, re-thread the web through the machine.
46	TRANSFER ROLL JAM PE11171 The phototeye that looks across the transfer roll has detected a jam. Clear the jam and try to determine the cause. Continue with normal starting procedures.
	U
31	UNWIND STANDS LOSS OF AIR PRESSURE This message indicates that an air pressure switch has detected an air pressure that is not sufficient enough to operate the machine. To clear this message, check that the hand valve on the main air line is open. If the problem still exists, then check the incoming line pressure. **CAUTION**: When working around high pressure air couplings.
114	UNWIND STAND MAIN AIR OVERRIDE This message indicates that a main air solenoid is manually overridden. To clear this message, remove the device used for the manual override.
	V
33	VACUUM PUMP OFF The vacuum pump is *Off*. To clear this message, start the vacuum pump.
	Z
98	ZERO SPEED SHUTDOWN The machine shut down because the zero speed switch minimum speed was not maintained. To run, turn the folder speed up and continue with normal startup procedures.

Chapter 9 Glossary

Section A

Machine Terms

Adjustable Nip Jacks - A two piece, threaded device that, when rotated, changes the nip between embossing rolls.

Anvil - Piece of hardened steel that acts against a hardened steel blade (fly knife).

Anvil Roll - A roll that holds the anvil blades and cuts the product to the desired length. (Napkin Folders have vacuum on this roll).

Back Pressure - A tension applied to the Folding rolls by the building product.

Bander - A machine that automatically compresses and wraps a paper sleeve around four sides of a package of napkins or towels.

Bander Festoon - A system of pull rolls/idler rolls which aid the sleeve rolls in pulling the sleeve stock.

Bastard Gears - These are gears with a non-standard pitch diameter, such as those that are sized to a specific roll diameter.

Belt Carry Down - A system of belts and guides used to carry product from point A to B. On Napkin Folders, in the twin type, product is carried from the quarter fold rolls to the table. On an Interfolder the product is carried from the transfer rolls to the folding rolls.

Build Rate - Term usually in inches/second that is used to describe the speed of the package building fingers carriage.

Bulk - The amount of emboss put into the sheet to aid in packaging.

Calender - A system of rolls that meters the sheet to a certain thickness. (Pull rolls or feed rolls have a similar effect).

Case packer - Machine that takes a finished product and inserts them into a cardboard case.

Catwalk - A steel platform used to access portions of the machine. Caution should be used on these platforms as they are primarily for maintenance purposes.

Chuck - Used to refer to a piece of tapered steel that is inserted inside of a core adapter or the rolls core.

Clip - The separated, slit and/or cut individual, prepackaged product stacks.

Common Edge - Reference location used for alignment of product within the machine.

Compression Station - The area in the bander where the loose pack is compressed by an air cylinder.

Core Adapter - An assembly that fits over the chucks and into the parent rolls core to create a better fit.

Cutoff - Refers to the length of the finished product in terms of type. Shear *cutoff*, is clean cut. Perforated (Perf.) bond or tab *cutoff*, leaves a small piece of the product intact at predetermined intervals. Serrated *cutoff*, cuts product off leaving a serrated edge.

Cycle - Used to describe the complete sequence of events involved for an assembly to run its course and reset (finish).

Dancer Unit - This assembly keeps proper tension on the web.

Decal edge - A rough edge on the parent roll which is often trimmed off during the converting process.

Die Roll - Engraved steel embossing roll.

Dispenser Fold - Any napkin that will fit in a dispenser. (generic term) (Napkin folder)

Double Transverse Fold - Usually 17" cutoff and

1/4 folded through plows then folded in half twice in the folding head. (Napkin folder)

Doctor Blade - A stiff piece of plastic or other material that is used to clean off rolls, wheels and other surfaces from paper dust, glue and ink.

Down Stream - The direction of web or product travel.

Drive End of Embosser - The side with the gears on. (Interfolder)

Drive Side - The side of the machine where the drive components and/or the line shaft is located.

Drop Tray - A table top that drops on a specified count to leave one napkin higher than others as they are packed off. (Napkin folder)

Elevator - Refers to an assembly designed to move the product in a vertical motion and reset itself.

Emboss - Pattern imprinted on paper product using steel-on-steel or steel-on-paper embossing rolls.

Family Pack Separator - This functions the same as a separator except it feeds a plastic wrap machine. Sometimes called a 300 count separator because this is a common package size. (Napkin folder)

Fixed Frame - The "Bolted On" upper folder frame unit.

Flipper - The part on the Lap Roll which "flips" the product away - aiding in product overlap. (Interfolder)

Fly Knife - A hardened steel blade. (Napkin folder)

Fly Knife Roll - A roll that holds the fly knife blades and cuts the product to the desired length. There is no vacuum on this roll. (Napkin Folder)

Folding Head - A system of rolls arranged to make a certain product.

Former - A "V" shaped plate used to crease the web lengthwise as it is pulled through the machine. Also called a plow. (Napkin folder)

Glue Gun - A high pressure glue module used in the application of a glue spot.

Guard - Used to protect the Operator from moving parts in the machine. All guards *must be in place* during machine operation.

Guest Towel - A fold made on special plows where the first panel is tucked inside the other two panels before they are folded in half through rolls. (Napkin folder)

HAYSSEN - Brand name of a plastic wrap machine.

Horizontal Embossing Unit - The embossing rolls lay side by side.

Idle End of Embosser - The side with the drive sheave. (usually Interfolder)

Index - Refers to a back and forth motion or an advancing action used by many of the different assemblies found on these machines.

Interfolder - See Multifold and Singlefold Towel.

Jump Table - Located on the separator elevator to help "snap" perf tabs by compressing the package.

Knife Bed - Support for bander knife blades. (Napkin folder)

Knife Roll - A vacuum roll that holds the anvil blades and cuts the product to the desired length. (Napkin Folder).

Lateral Register - System of moving the parent roll to aid in lining up the sheet in the folder.

Left Hand Folder - When looking *down stream* the product packs out to the left. (Napkin

folder)

Log - A term commonly used to refer to product that is wrapped in a sleeve at the exit of the bander.

Log Stop - Fixed location (mechanism) used to locate product in a precise position.

Magazine Rail - Side guide on a separator table top to guide the product during separation and transfer to the paddle assembly. (Napkin folder)

Magazine Stop - A wedge shaped strip fastened to the end of the magazine rail to prevent the napkins packed off from falling back. (Napkin folder)

Magazine Block - A support for magazine rails. (Napkin folder)

Manual Folder - Any folder with a drop tray/or table top instead of an automatic separator.

Micro-Adjust - A bushing with fine thread screws that is used for fine or circumferential adjustment of the rolls.

Movable Deck - The upper folder frame unit (assembly) that can be slid back slightly for maintenance purposes.

Multifold Towel - A type of fold a machine creates on the product stock, such that the a sheet of paper has 1/3 sheet tucked inside a previous sheet and 1/3 sheet tucked inside the following sheet.

Nip - This is commonly used to define the gap or distance between rolls. It is always a pinch point and caution should be used working in these areas.

Nose Rolls - Set of idler rolls at the lower tip of the plows. (Napkin folder)

OMEGA - Brand name of a plastic wrap machine.

Oper. or Opp. side - The operator side or side opposite the drive of the machine.

OPTIMA - Brand name of a plastic wrap machine.

Overwrapper - A machine that automatically compresses a package of napkins, then completely encloses the package in a paper sleeve. It is used in conjunction with a separator. (Napkin folder)

Packer (Shaft or Finger) Assembly - A set of fingers that pack product off of a roll (or stabilize it) onto a table or building log. This is actuated by an eccentric or cam drive.

Packer Roll - A vacuum roll that makes the second fold in the folding head (first and only fold if there is no quarter fold roll.) The napkins are "packed" off this roll onto the table. Also, referred to as an eighth (1/8) fold roll. (Napkin folder)

Parent roll - Roll of a specific width and diameter that is chucked in the unwind stand for conversion into a specific product.

Perforated - (See Cutoff)

"P.I.V." - A brand of Variable Speed Gearbox.

Pivot - Refers to motion used by an assembly to swing into and/or behind product and then return to its original position.

Plow - A "V" shaped plate used to crease the web lengthwise as it is pulled through the machine. Also called a former. (Napkin folder)

Ply Crimp - An embossed wheel presses against a smooth roll with more than one product ply in between the two. The process bonds the two plies together for stability.

Press Table - A manual machine used to put a pre-formed sleeve around a package of napkins. Used in conjunction with drop tables. (Napkin folder)

Progressive Compression - A series of plates attached to chains which cycle forward compressing a package against a stationary plate. The package is then transferred to

the next stage allowing the chains to cycle forward again. (Napkin folder)

Pull Rolls - A pair of rolls used to draw (pull) paper product through the machine.

Pusher - Refers to an assembly that is usually made up of air cylinders, an arm or carriage that moves product from point "A" to "B". This movement is in one direction.

Quarter (1/4) fold roll - See transfer rolls. (Napkin folder)

Reject Box *Or* Broke Box - A container used for the disposal of unfit product.

Ribbon Fold - A plow fold consisting of (6) panels made on a set of 3 reverse angle plows. (Napkin folder)

Right Hand Folder - When looking *down stream* the product packs out to the right. (Napkin folder)

Riser - A device used to fill in a gap to support the product.

Roll Loader - A pneumatic or hydraulic device that lifts a parent roll to load a turret unwind stand.

Salvage Press Table - Mounted near the discharge of an automatic bander. Used to manually put pre-formed sleeves on packages that did not get wrapped in the bander. It is similar to a press table.

Self Chucking Core Ejecting Shaftless Stand (SCCE) - An assembly that chucks a parent roll from both sides.

SENNING - Brand name of a plastic wrap machine.

Separator - A machine that automatically counts, separates and transfers a horizontal package of napkins or towels as they are packed off a folder.

Separator-Transfer Tilt - A machine that automatically counts and separates the package then tilts the napkins into a vertical stack. These usually feed a plastic wrap machine. (Napkin folder)

Sheave - Toothed timing pulley, that is run with timing belt.

Sheet - The term refers to the product after it has been perforated/cutoff and slit.

Side Trim Slitter - A Slitter blade that cuts the web to a given width.

Singlefold Towel - A type of fold a machine creates on the product stock, such that the second sheet has half of both the first and third sheet tucked inside its fold.

Slip - Speed differential between embosser and cutoff roll to create shorter length napkins. (Napkin folder)

Slug Roll - Type of embossing roll, it holds a plate with engraved pattern.

Slitter - A rotating wheel with a knife edge used to cut paper product to desired width.

SPECON - A brand of Variable Speed Gearbox.

Split Folder Frames - Folder frames with bolt in inserts over the cutoff rolls. Cutoff rolls can be removed and installed without removing their journals. (Napkin folder)

Staged Log - A log that lies between the folder and the bander.

Stiffener - A metal strip used to support, reinforce, strengthen or stabilize various components.

Stripper - An assembly for pulling napkins from separator transfer tilt fingers into the next stage (conveyor). (Napkin folder)

Stomper - A device for vertically compressing a stack of napkins to decrease bulk on the infeed to wrapper.

Synchronizer - A roll or set of rolls on a swing arm used to align prints, patterns and perforations to the cutoff. (Napkin folder -

Rewinder)

Throat of the Bander - The area after the compression station, where the transfer thru plate feeds the next product thru the bander.

Tapercone Drive - A flat belt wrapping two opposing tapered cones used to vary the output speed.

Transfer Roll - 1. A vacuum roll that makes the first fold in the folding head and or transfers the product to the packer roll. Located below the cutoff rolls. Also known as a quarter fold roll. (Napkin folder)
2. A vacuum roll that transfers the product from the perforator head to the folding rolls. (Interfolder)
3. A vacuum roll that transfers the product from the cutoff roll to the correct winding roll and rider rolls. (Rewinder)

Tucker -1. Device in banders that folds the sleeve around compressed pack. 2. A part in folding rolls of an Interfolder.

Turn Station - An assembly that turns the web 90° (degrees) from the unwind stand to the next station in line (usually an embosser). This unit usually has one or more slitters and is sometimes called a slitter turn stand.

Turret Unwind Stand - An assembly wherein the parent roll is slid over one of two spindles. You can load one spindle while the other is being run, then rotate the full roll into running position.

Twin type folder - A folding head with two sets of cutoff rolls and two quarter fold rolls. This machine folds two napkins at a time per lane. (Napkin folder)

Vertical Embossing Unit - The embossing rolls are stacked on top of one another.

Vertical 1/8 Fold - A plow fold consisting of (4) panels made on a set of (2) reverse angle plows. Then it is folded once in the folding head. (Napkin folder)

Vertical 1/6 Fold - A plow fold consisting of (3) panels made on a set of (2) reverse angle plows. (Napkin folder)

Wad - Mass of foreign material thicker than the paper stock, ply or plies, that will cause the machine to not function properly.

Web - Refers to the paper as it spans the width of the machine.

W-Fold - Four (4) panel product.

Zero Reference Point - Theoretical point based on machine cutoff. It is defined as the distance from the point of intersection of one folded towel, the guide and the folding roll down to the top of the lower frames.

Zig-Zag fold or Multifold - A three (3) panel sheet of product.