CompuSheeter

Owner's / Operator's Manual

Printed 9/28/10 by

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This manual is available in Spanish, French, Italian and, German language translations.

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Safety

Safety must be a primary concern, when operating or performing maintenance procedures follow all standard safety guidelines. Do not wear loose fitting clothing or any articles that may be pulled into the mechanisms.

Be sure that when operating the equipment that all safety devices operate properly. Never under any circumstances disable, remove, or alter the original configuration of the safety system. Should any component of the safety system become inoperable, immediately discontinue operation, and notify a supervisor.

Avoid placing fingers, hands or, any other body part in or, near any cutter blades, feed rollers, sprockets, or other moving mechanisms.

When servicing the unit always practice standard lockout/tagout procedures to avoid personal injury.

The CompuSheeter is equipped with hinged interlocking safety guards at the input and output of the unit. If at any time the safety circuit is interrupted, power is immediately removed from the system stopping all movement of the cutter and increment drive rollers. Movement can not resume until the guard is restored and the safety system reset.

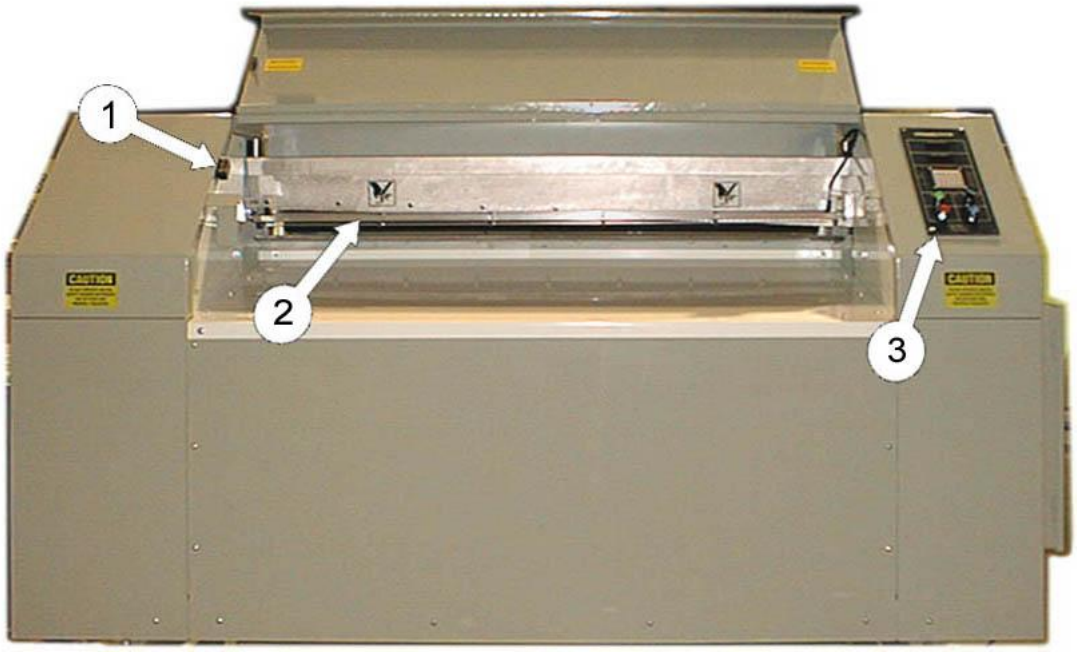

Figure 1: CompuSheeter Front View

Item	Description
1	Material Output Area Hinged Guard Interlock Switch
2	Static Eliminator
3	Main Operator Control Panel

Table 1: CompuSheeter Front View

Hinged Guards

The material input and output areas of the CompuSheeter are protected by hinged interlocking guards. The guards must be down at all times before operation may occur, opening either the Input or Output Guards will interrupt the safety circuit, stopping all movement. The guard must be replaced and the safety circuit reset before movement may resume.

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Installation

The following subsections contain information about installing the equipment. This section must be read and understood prior to attempting to setup of the equipment.

Unpacking

The unit was carefully packaged at the factory to avoid damage during shipment, should any accidental damage occur contact the responsible freight company immediately and report the damage.

When removing the machine from the truck notice any "Heavy" or "Fork this Side" markings to avoid tipping or damaging the crate.

Placement

Placement of the equipment should allow access for the operator and maintenance personnel. It is recommended that a four-foot area around the unit be provided. The machine must be placed on a hard and level surface. A footprint view of the CompuSheeter system is provided in Figure 2.

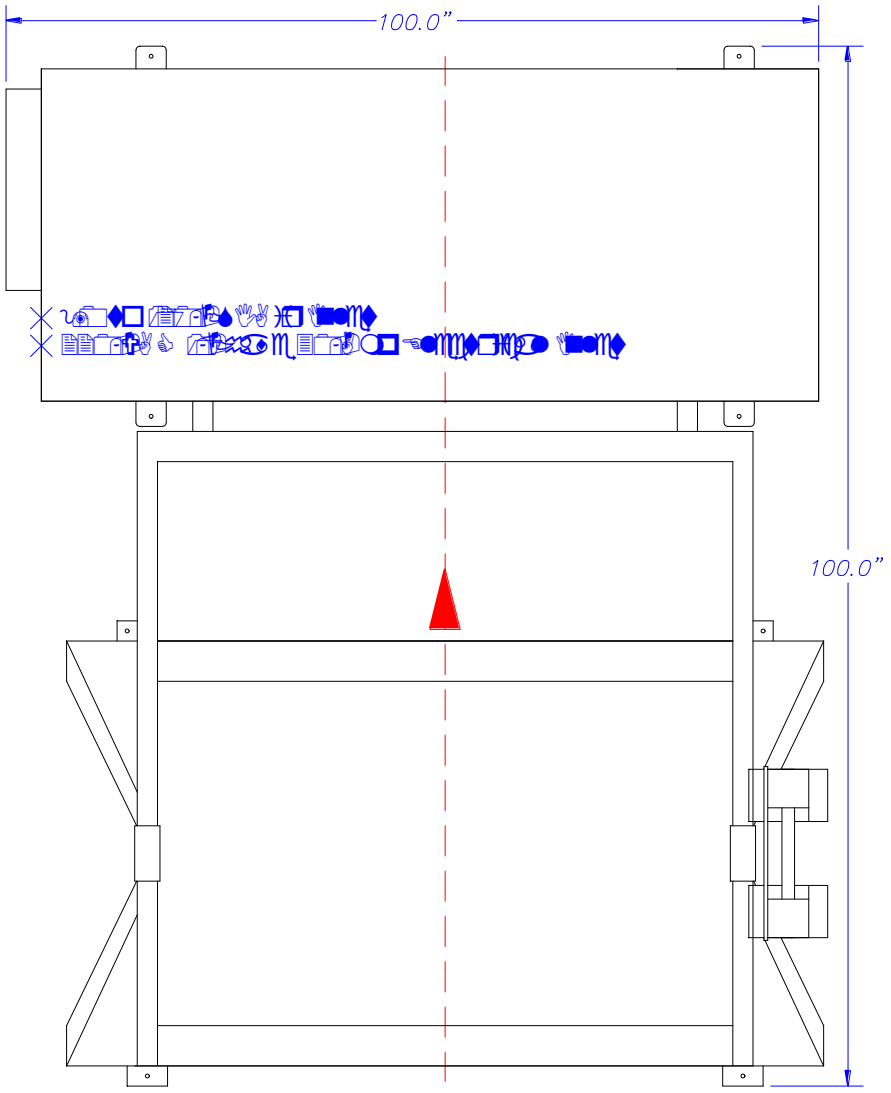

Figure 2: CompuSheeter System Footprint

Leveling

The system should be leveled before operating the unit. Leveling may be accomplished using a bubble level and shimming under the base plates prior to fixing the units to the floor.

Material Unwind

The Unwind Mandrel resting in the Unwind Mandrel Support Blocks, and the lower support tube of the "A" frame may be used as reference points to level the Unwind Stand.

Sheeter

The Lower Cutter Blade, and the plate over the Increment Nip Roller set of the CompuSheeter unit may be used as reference points for leveling the "X" and "Y" planes.

Assembly

Assembly of the CompuSheeter will be necessary before leveling and electrical connections are completed.

The following steps represent the typical CompuSheeter System assembly procedure.

1. Position and level the CompuSheeter in the desired location.
2. Attach the Unwind Stand as shown in Figure 3, using the provided hardware to bolt the base frame of the modules together, do not tighten the attachment bolts at this time.
3. Level the Unwind Stand as described in Section 2.3 and tighten the attachment bolts.

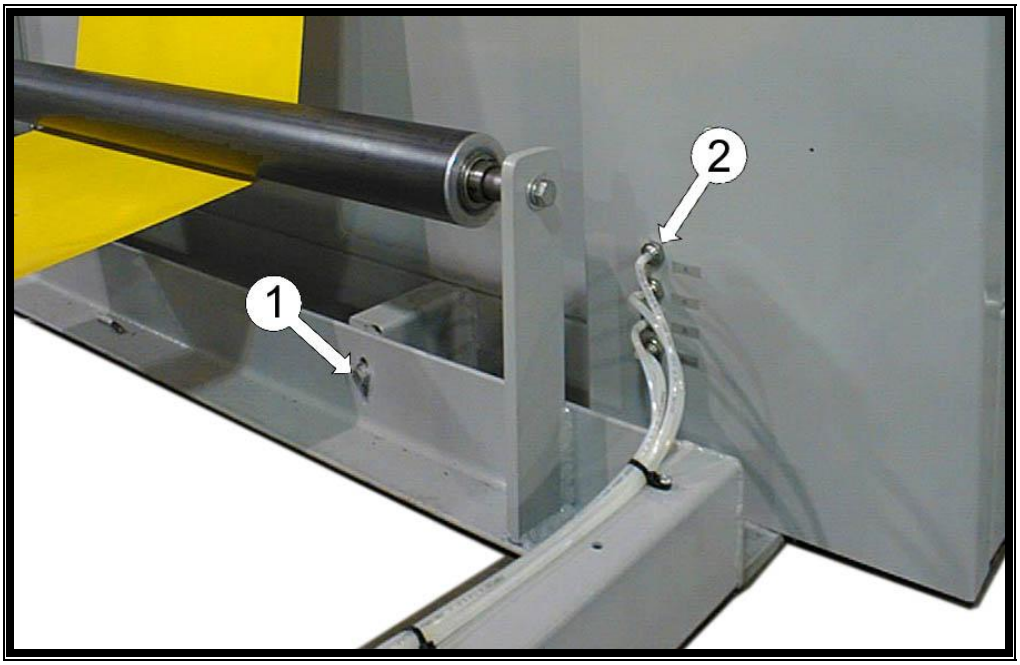

Figure 3: Unwind Assembly Detail

Item	Description
1	Unwind Attachment Bolt (2 ea.)
2	Unwind Pneumatic Bulk Head (4 ea.)

Table 2: Unwind Assembly Descriptions

Electrical

The voltage and amperage requirements can be found on the equipment ID plate. The plate is located near the main power inlet. If the line voltage varies from that on the ID plate, notify Contech before applying power to the system. During any maintenance operations, the main power must be removed from the system.

Electrical hookup of the 220 to 440-VAC /3-↓ systems requires proper phasing. When connecting the power cord to a three-phase power source, the rotational direction of the electric motor must be observed. When looking into the fan end of the motor, the motor fan must be turning clockwise.

All electrical connections should be performed by a locally licensed electrician.

Pneumatic

The CompuSheeter requires less than 5-cfm clean dry air at 80 to120-psi. An air inlet is located near the electrical inlet box. To avoid damage to any components in the system it is important that the compressed air is free of moisture and other debris. Please note that an air compressor is not supplied with the CompuSheeter system.

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Overview

The Primary function of the CompuSheeter is to convert roll goods into accurately measured and cut sheets. The CompuSheeter measures and cuts multiple sheets of material based on operator entered length, speed, and batch values. Options are available for the CompuSheeter enabling it to process a variety of materials used in many industries. This Manual may contain information that does not apply to each installation.

Unwind Station

The basic function of the unwind station is to support a roll of material and provide web tension while the material is being unwound. Contech has many designs available to accommodate different material roll parameters. The weight, diameter, width and core diameter are all factors in specifying an unwind stand. Presented in this section are the most common 500-1b. and 1,000-1b. unwind stations. The working elements and operation of the station are similar through all designs.

Brake

For some applications, a pneumatic disk brake is necessary to provide finite control of web tension. Roll sizes and feed rates primarily determine the size and style of brake to be used. A roll with less mass produces less inertia so it normally requires a smaller brake, where as a larger or heavier roll will require a larger brake. Air actuated brakes can be controlled manually by the operator or automatically by using a feedback device.

Leather Drag Brake

A strap attached to the dancer applies braking action for the material roll, when the dancer is in the down position. When material is incremented, the web lifts the dancer to loosen the strap allowing material to unwind. As the material is incremented, the dancer is lowered applying the brake and increasing web tension, causing the dancer to raise maintaining constant web tension through starting and stopping of the feed cycle. For the brake to operate properly the material must unroll from the top, so braking force is applied to the fixed end of the leather brake strap. The fixed end of the strap is adjustable, permitting the tension to be reduced for lighter and more fragile material webs.

Manual Pneumatic Brake

The Manual Pneumatic uses a pneumatic disc brake to apply braking action to the unwind roll. Pressure is controlled manually and must be adjusted throughout processing of the roll.

The web tension must be reduced for lighter and more fragile materials. As the material roll becomes smaller, brake tension must be reduced to prevent slippage between the increment and pinch rollers. Proper adjustment of the unwind brake is achieved when the dancer is active without reaching either full travel limit while allowing the material to feed without slipping in the nip roller.

Dancer Linked Brake*

The Dancer Linked Pneumatic Brake combines the functionality of the Pneumatic Disk Brake and the automation of the Leather Drag Brake to produce an automatic pneumatic disk brake that is controlled by the position of the Dancer Roller. Turning the Brake Pressure Regulator knob located on the Auxiliary Operator Control Panel will adjust the air pressure supplied to the Dancer Linked Pneumatic Brake System.

The Brake Pressure Regulator controls only the maximum pressure that the system is capable of supplying to the disk brake when the Dancer Roller is in the full back (Run) position.

The percentage of the maximum available brake pressure delivered to the disk brake is determined by the position of the dancer roller. When in the Load position the brake pressure is at minimum (0 to 3-psi) the maximum available pressure is limited by separate regulator. As the dancer roller moves to the end of its run position stroke pressure applied to the disk brake is increased, creating increased braking action. As the dancer roller moves to the end of the load position stroke, the pressure applied to the disk brake is decreased creating decreased braking action. Because the Dancer Linked Pneumatic Brake System is controlled by the position of the Dancer Roller only the necessary brake pressure to stop the unwind mandrel is applied to the disk brake.

Web tension is determined solely by the pressure indicated on the Web Pressure Gauge, this reading does not directly represent Material Web **P**ounds per **L**inear **I**nch (PLI).

Proper operation of the unwind stand occurs when the dancer is active without reaching either full travel limit while allowing the material to feed without slipping in the nip roller.

Increment Drive

The increment system consists of an increment roller directly driven by a hydraulic motor, a proportional control valve, a length encoder, and the control electronics. The hydraulic motor converts oil flow and pressure into rotational speed and torque. Braking action is provided at the motor by restricting or stopping the oil flow. The high system pressure generated from the hydraulic power unit can generate Very high torque. The proportional control valve (located on the hydraulic power unit) provides oil flow to the motor. Modulating the current flow through the valve controls the orifice

* Indicates optional equipment that is not available with each installation.

size and thus controls the speed of the roller. Although the motor is capable of rotating in both directions, the valve only provides oil flow in one direction and therefore, only forward rotation is available. The computer controls the current being supplied to the control valve. An encoder, mounted to the input guard, returns position information to the computer. The program and controlled electronics of the main board calculate the increment length, speed, and acceleration of the roller.

Cutter Blade

The cutting system uses a hydraulic rotary actuator to control the blade movement. To perform a single cut, the rotary actuator must rotate one-360° revolution (rotational direction is not critical). During the rotation, the blade is pulled down and then lifted and held at **T**op-**D**ead-**C**enter (TDC). An electrically operated hydraulic control valve directs oil flow into a counter balance valve before passing to the actuator. The counter balance valve is an adjustable pilot operated check valve for the return line, and allows unrestricted flow to the actuator. When no pressure is supplied to the counter balance valve, return oil from the actuator has no path back to tank. With no path to return to tank, oil flow is blocked. With oil flow blocked, the rotary actuator is locked into position. By restricting return oil of the actuator, speed and force of the blade can be maintained throughout the entire cut cycle. Internally, a piston is forced back and forth through the actuator cylinder by oil flow supplied by the control valve. Oil is forced into opposite ends to move different directions. The piston translates its linear movement to the externally rotating shaft by a rack-and-pinion mechanism. Magnets are mounted on the internal piston to provide position sensing. Two Movable sensors, mounted externally, are engaged when these magnets pass under them.

Note:
Failures internal to either valves or the actuator could allow oil flow while the control coils are inactive.

Material Core Support

Core inserts are available in a variety of styles and sizes; the following subsections describe the operational procedures and limitations of material core and mandrel support devices.

Tapered Core inserts*

The standard Tapered Insert is manufactured by:

Contech Inc.
1756 S. 151st Street W.
Goddard, KS 67052

The Tapered Insert is designed to be slid over the Unwind Mandrel, tapped into the Material Core with a soft-faced mallet. The setscrews are tightened onto the flat area of the Unwind Mandrel, figure 9 offers a picture of the Tapered Core Insert.

Installation (Cantilevered Mandrel)*

The following steps represent the typical tapered core insert installation procedure for a cantilevered mandrel with a mechanical support gate.

1. Insure that the equipment is in a safe condition; see the Safety section of this Manual.
2. Open the mandrel support gate, if equipped with one.
3. Loosening the setscrew, remove the outer core insert.
4. Noting the position of the lead end of the roll, slide the material roll over the mandrel and onto the core insert.
5. Aligning the setscrew with the flat landing on the mandrel, install the outer core insert, sliding it over the mandrel and inserting it into the material roll.
6. Tighten the setscrew in each core insert.
7. Close the mandrel support gate, if equipped with one.

Installation (Drop-In Mandrel)*

The following steps represent the typical tapered core insert installation procedure for a removable mandrel using Tidland Safety Chucks.

1. Insure that the equipment is in a safe condition; see the Safety section of this Manual.
2. Rotate the Safety Chuck to the open position.
3. Pull the top of the chrome ring away from the center of the mandrel, opening each chuck.
4. Lift the Mandrel from the safety chucks.
5. Remove the core inserts, allowing one core insert to remain on the mandrel when possible.
6. Lay the material roll on its side on the floor.
7. Insert the mandrel into the material core, noting the orientation of the mandrel support lugs if necessary.

* Indicates optional equipment that is not available with each installation.

8. Aligning the setscrew with the flat landing on the mandrel, install the outer core insert, sliding it over the mandrel and inserting it into the material roll.
9. Install the remaining core insert, if it was removed.
10. Aligning the mandrel with the safety chucks, replace the mandrel and material into the safety chucks.
11. Pushing the chrome ring of the safety chucks toward the center of the mandrel, close the safety chucks.

*Mechanical Expansion Chucks**

The standard Mechanical Expansion Core insert is manufactured by:

Blackhawk Chuck Corp.
545 12th Street
Rock Island, IL 61201

It is available in 3", 4", 6", and 8" OD sizes and may be used in conjunction with a tapered insert. The following diagram is of a correct expandable chuck application.

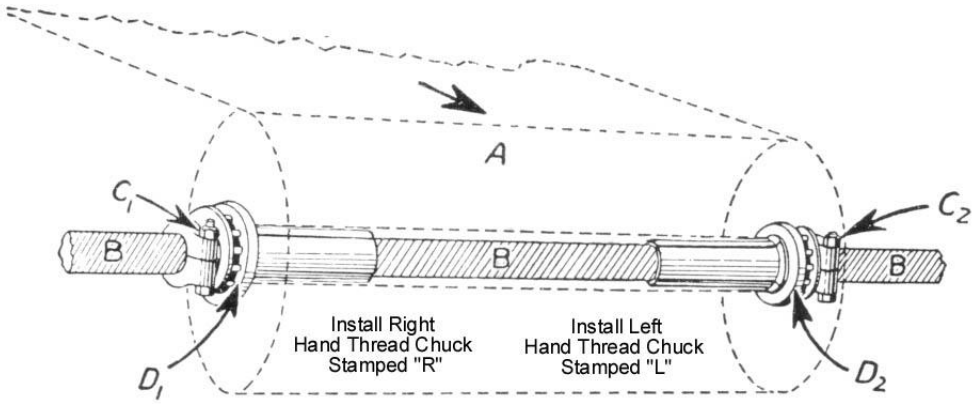

Figure 4: Mohawk Chuck Installation Directions

1. The right hand threaded chuck is attached to the Mandrel (B) on operator's left-hand side.
2. The left-hand threaded chuck is attached to the Mandrel (B) on the operator's right-hand side.
3. With Material Roll or core in place, tighten the Expansion Nut (D1) in the direction of the arrow.
4. Tighten the Clamping Bolt (C1).
5. Tighten Expansion Bolt (D2).
6. Tighten the Clamping Bolt (C2).
7. To remove the Core insert, reverse the above steps.

* Nut (D1) should move closer to clamping bolt (C1) and (C2) when above directions are followed.
* When the web leads under roll reverse the chucks from the above diagram.

*Pneumatic Expansion Core Insert**

The standard Pneumatic Expansion Core insert is manufactured by:

Tidland Inc.
P.O. Box 1008
Camas, WA 98607

The Expandable Pneumatic Core insert is available in a variety of styles and sizes.
Operating pressure for the standard pneumatic Core insert is 90 to 120-psi.

*Installation (Cantilevered Mandrel)**

The following steps represent the typical pneumatic core insert installation procedure for a cantilevered mandrel with a mechanical support gate.

1. Insure that the equipment is in a safe condition; see the Safety section of this Manual.

* Indicates optional equipment that is not available with each installation.

* Indicates optional equipment that is not available with each installation.

2. Open the mandrel support gate, if equipped with one.
3. Insure that the chucks are completely deflated.
4. Remove the outer core insert.
5. Noting the position of the lead end of the roll, slide the material roll over the mandrel and onto the core insert.
6. Install the outer core insert, sliding it over the mandrel and inserting it into the material roll.
7. Inflate both core inserts.
8. Close the mandrel support gate, if equipped with one.

*Installation (Drop-In Mandrel)**

The following steps represent the typical pneumatic core insert installation procedure for a removable mandrel using Tidland Safety Chucks.

1. Insure that the equipment is in a safe condition; see the Safety section of this Manual.
2. Rotate the Safety Chuck to the open position.
3. Pull the top of the chrome ring away from the center of the mandrel, opening each chuck.
4. Lift the Mandrel from the safety chucks.
5. Insure that the chucks are completely deflated.
6. Remove the core inserts, allowing one core insert to remain on the mandrel when possible.
7. Lay the material roll on its side on the floor.
8. Insert the mandrel into the material core, noting the orientation of the mandrel if necessary.
9. Slide one core insert over the end of the mandrel inserting it into the material core.
10. Install the remaining core insert, if it was removed.
11. Aligning the mandrel with the safety chucks, replace the mandrel and material into the safety chucks.
12. Pushing the chrome ring of the safety chucks toward the center of the mandrel, close the safety chucks.

*Pneumatic Expansion Shafts**

The standard Pneumatic Expansion Shaft is manufactured by:

Tidland Inc.
P.O. Box 1008
Camas, WA 98607

The Expandable Pneumatic Mandrel is available in a variety of styles and sizes with optional journal and valve arrangements.
Operating pressure for the standard pneumatic mandrel is 90 to 120-psi.

Figure 5: Leaf Type Pneumatic Mandrel

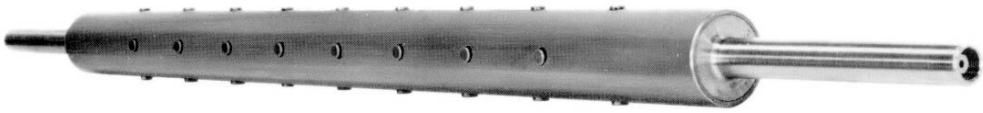

Figure 6: Button Type Pneumatic Mandrel

Figure 7: Pad Type Pneumatic Mandrel

Installation (Cantilevered Mandrel)*

The following steps represent the typical pneumatic mandrel installation procedure for a cantilevered mandrel with a mechanical support gate.

1. Insure that the equipment is in a safe condition; see the Safety section of this Manual.
2. Open the mandrel support gate, if equipped with one.
3. Insure that the mandrel is completely deflated.
4. Noting the position of the lead end of the roll, slide the material roll over the mandrel.
5. Inflate the mandrel.
6. Close the mandrel support gate, if equipped with one.

Installation (Drop-In Mandrel)*

The following steps represent the typical pneumatic core insert installation procedure for a removable mandrel using Tidland Safety Chucks.

1. Insure that the equipment is in a safe condition; see the Safety section of this Manual.
2. Rotate the Safety Chuck to the open position.
3. Pull the top of the chrome ring away from the center of the mandrel, opening each chuck.
4. Lift the Mandrel from the safety chucks.
5. Insure that the mandrel is completely deflated.
6. Lay the material roll on its side on the floor.
7. Insert the mandrel into the material core, noting the orientation of the mandrel if necessary.
8. Inflate the mandrel.
9. Aligning the mandrel journals with the safety chucks, replace the mandrel and material into the safety chucks.
10. Pushing the chrome ring of the safety chucks toward the center of the mandrel, close the safety chucks.

Safety Chucks*

The standard Mandrel Support Safety Chuck is manufactured by:

Tidland Inc.
P.O. Box 1008
Camas, WA 98607

The Safety Chuck is available in a variety of styles and sizes with optional journal and mounting flange configurations. Figure 8 represents a typical Tidland Safety Chuck shown in the open position.

The following steps represent the typical safety chuck operation procedure using Tidland Safety Chucks.

1. Insure that the equipment is in a safe condition; see the Safety section of this Manual.
2. Rotate the chuck to the open position.
3. Pull the chrome ring away from the center of the mandrel.
4. Lift the Mandrel from the Safety Chucks.

Figure 8: Tidland Safety Chuck

* Indicates optional equipment that is not available with each installation.

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Surface Unwind Station

Contech manufactures a Surface Unwind Station for materials, which for various reasons are not attached to a core. The typical design uses a series of rollers to support the material roll; adjustable edge guides allow control of lateral movement. Braking action is applied to one of the support rolls preventing run-on of the material roll.

Figure 9: Surface Unwind Station

Depending on roll weight and diameter a web sling or core hoisting device may be required to safely load the material roll onto the surface unwind.

The following steps represent the typical Surface Unwind operation procedure.

1. If the machine is equipped the web guiding option, insure that the support carriage is in the center position prior to loading the material roll.
2. Insure that the equipment is in a safe condition; see the Safety section of this manual.
3. Turning in a counterclockwise direction, loosen the edge guiding plate securing handles and move the edge guiding plates to the outmost position.
4. Place the material roll on its side, insuring the orientation of the leading end of the roll will allow proper operation after being placed in the unwind support.
5. Using a safe method, lift the material roll onto the support rollers, centering the web when possible.
6. Slide the edge guides into position, placing the roll in the desired location.

Web Guide Station

The typical control system is produced by North American Manufacturing, it will allow processing of telescoped rolls or rolls with uneven edges. Web Guiding is available with most unwind station designs, utilizing several control systems enabling different referencing configurations; edge, center and line following capabilities.

Slitting

Contech offers several types of slitter station options the following sections contain information about three of the most common configurations. Although the mounting styles differ between applications, the basic geometry and components for each type of slitting are the same.

Razor Slitting

The razor slitting option uses a sharp "razor" blade to cut material before it reaches the nip rollers. The blades are inexpensive and can be discarded after use. The single edge blades are mounted with one end extended beyond the holder, exposing it for cutting. By flipping the blade, each blade can be used twice before discarding. The holders are mounted to a bar suspending them across the width of the web. Each holder is positioned to force its blade through the material.

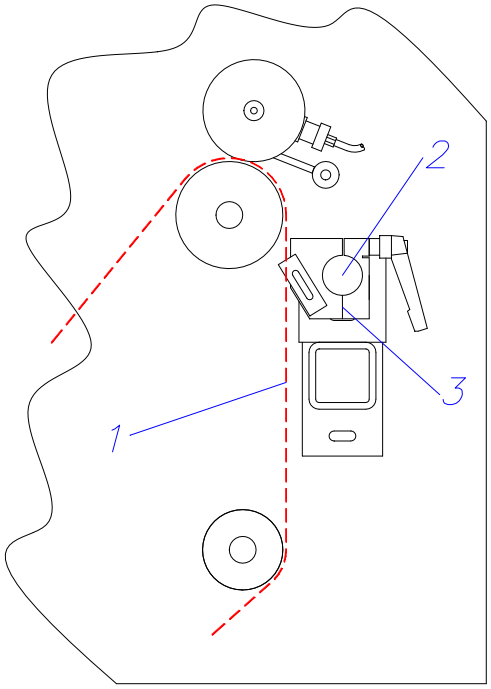

Figure 10: Typical Razor Slit Configuration

Item	Description
1	Material Web
2	Slitter Body Support Tube
3	Razor Slitter Body

Two adjustments are required for this slitting system; the distance between slitting blades and the extension length of the razor blade. To adjust the slitting width, loosen the ratcheting handle, move the holder into the new position and re-tighten ratcheting handle. During operation, the blade edge will become dull. To replace or rotate the blade, loosen the clamp plate and remove the blade. Reinstall the blade by placing the blade into the slot and retighten the clamp plate.

Score Slitting

Score style slitting cuts the material using a circular knife that is pressed against a hardened anvil roller. The cutting action is performed by pinching the material between the knife and roller. The score slitting knives have a radius across the cutting edge and therefore are not extremely sharp. The circular knife blades roll with the anvil roller as material is being feed into the CompuSheeter. The turning action prevents dulling of the knife-edge by slipping against the surface of the roller. The knife is held in position by the knife mounting assembly. The assembly is mounted to a steel dovetail rail extending the width of the material web. When initially mounted to the dovetail, the blades are held ¾" above the anvil roller. Air pressure applied to the assembly extends the knife, lowering it against the roller.

The steel dovetail assembly provides a quick and convenient method of moving and mounting the slitter assemblies. To move a slitter knife to a new position, loosen the setscrew, move the knife assembly along the dovetail, and tighten the setscrew. Measure the distance between adjacent knives by measuring the distance between blades. To remove, loosen the setscrew farther, and tilt the knife assembly away from the dovetail. The air supply required for the slitters are provided through quick disconnects located on the air supply tube. When a slitting station is not required, the knife assembly should be removed. To prevent entanglement of the air supply hoses, all mounted slitters must be connected to the air supply.

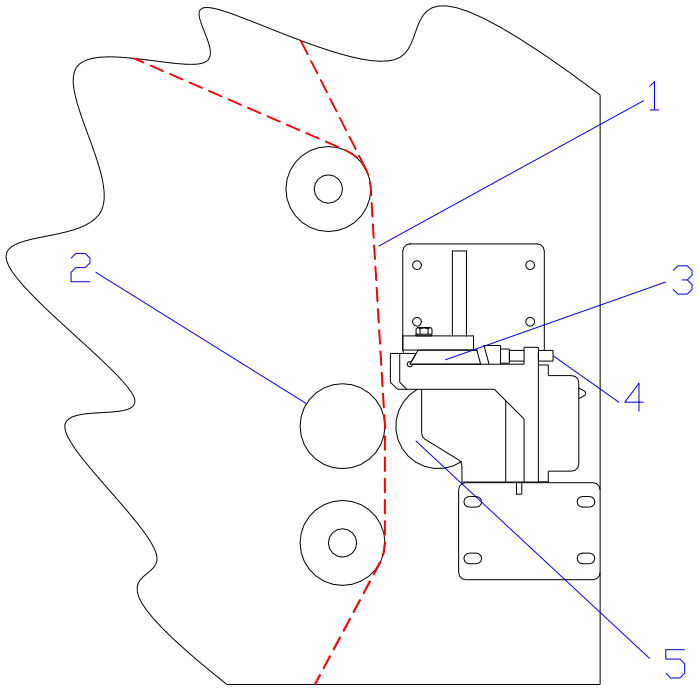

Figure 11: Typical Score Slit Configuration

Item	Description
1	Material Web
2	Slitter ring drive roller
3	Dove Tail Bar
4	Slitter Body Position Lock Screw
5	Score Slit Blade

The auxiliary control panel allows control of the slitter blades. An ON/OFF switch will lift and lower the cutter blades. When off, the air supply to the slitters is disconnected and the slitters move away from the roller. All of the knives are lowered against the roller when on. A pressure regulator and gauge control the cutting pressure applied by the knife against the score roller. Rotating the regulator clockwise will increase the air pressure supplied to the air supply tube. Increased air pressure increases the cutting force. The gauge provides a reading that can be repeated after processing other materials.

The cutting pressure should be adjusted to the minimum pressure required to cut the material. Properly adjusting the cutting pressure will extend the slitter blade life. Before running material, lower the cutting pressure. Once the material is loaded, gradually increase the pressure until all knives are cutting.

Shear Slitting

The shear slitting option cuts by shearing material between cutting blades above and below the material. Changing the position of the cutting blades requires moving both the top and bottom knives. The knives must be positioned before loading material. Take extreme caution when moving them to avoid being cut. Take precautions to prevent damage to the cutting edges. The bottom knives are locked onto the slitter ring drive roller with non-marring setscrews. Move the slitter ring by loosening the setscrews and sliding the ring across the roller. Re-tighten the set screws. To position the top knife, loosen the adjustment knob and position where the top-knife when extended will drop next to the slitting ring. Tighten the adjustment knob.

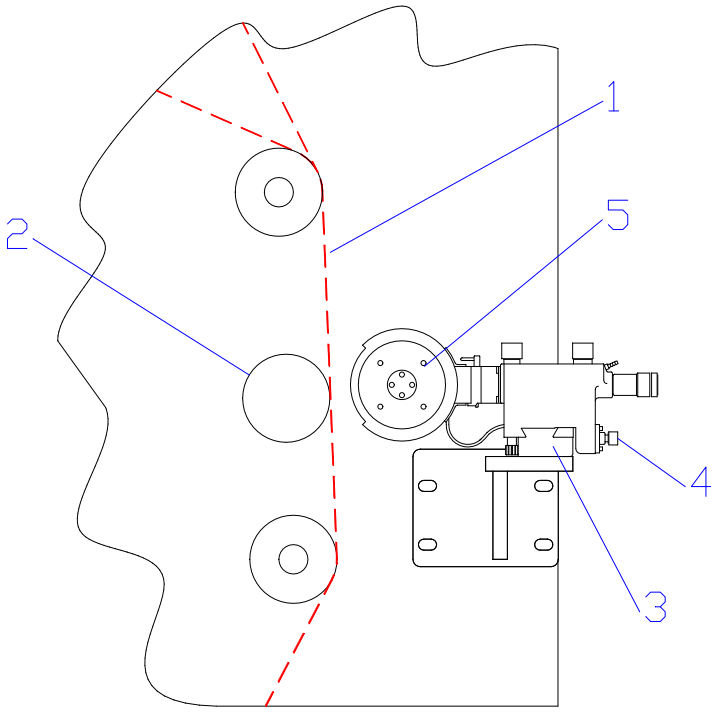

Figure 12: Typical Shear Slit Configuration

Item	Description
1	Material Web
2	Shear Slitter Counter Knife
3	Dove Tail Bar w/Rack
4	Slitter Body Position Lock Knob
5	Reciprocating Shear Slit Blade

The operator has ON/OFF control along with operating pressure adjustments. The control components are located in the auxiliary control panel. The ON/OFF switch lowers and raises the slitting knives. When OFF, the slitters will lift away from the roller to simplify loading and unloading of material. The pressure regulator controls the pressure applied by the top blade laterally against the bottom blade. By recording the gauge reading, the shearing pressure can be reused for repeat runs of the same material. Optimum cutting performance exists when the material is being cut with minimum pressure. Excess pressure will decrease the blade life. Manufacturer's information about the particular slitter option purchased may be found in the back of this manual.

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Operator Controls

Operator Controls are grouped according to the function provided at various locations around the CompuSheeter. The Main Operator Control, Auxiliary Control Panels and, any additional controls are described in the following Subsections. Many options are available with the CompuSheeter this Manual may contain information that does not apply to each installation.

Main Operator Control

Control functions associated with the basic system are accessed through the operator control panel, located on the front of the CompuSheeter. Controls for optional functions are typically located at the auxiliary control panel.

Figure 13: Main Operator Control Panel

Entering Numeric Data

Four parameters are required to control the operation of the CompuSheeter. The sheet length, number of sheets, top increment speed, and accel / decel rate can all be changed through the numeric keypad. The top display is used to show the data as it is being entered. All entries must end by pressing the "ENTR" key. Before values can be changed, the corresponding LED indicator must be on and, the "AUTO", "MANUAL", and "GO" indicators must be off.

ENTERING SHEET LENGTH

Pressing the "L" key will initiate the sheet length change. The red "LENGTH" indicator must be illuminated. If the indicator is not on, press the "L" key again. The current length will be shown in the top display window. To change the value, press the "CLR" key to erase the current value, enter the numeric sequence for the length desired, and press "ENTR". After entering a new length value, the new length will be displayed in the second window. The length is entered in 1/100" units. Pressing the sequence "1", "2", "0", "0" will enter 12.00" as the increment length. The maximum length entry is 999.99".

If the optional metric length entry has been selected the entry scheme is identical. The value entered by the operator is in 1/100-cm resolution. Entering "2", "4", "0", "0" programs a length of 24.00 cm.

ENTERING A BATCH COUNT

Pressing the "B" key will initiate changing the batch count. The red "BATCH" indicator must be illuminated. If the indicator is not on, press the "B" key again. The current batch will be shown in the top display window. To change the value, press the "CLR" key, enter the new batch count, and press "ENTR". The total value will also be cleared once a new batch count has been entered. The batch counter entry range is 1 to 99,999.

ENTERING INCREMENT SPEED

Pressing the "S" key will initiate changing the increment speed. The red "SPEED" indicator must be illuminated. If the indicator is not on, press the "S" key again. To change the value, press the "CLR" key, enter the new speed value, and press "ENTR". The speed values range from 1 to 11. Speeds 1 to 10 perform their incrementing using the programmed acceleration rate. The system will modify its speed setting during operation if the length can not be obtained at the current speed and rate settings. Speed 11 increments by starting and stopping as fast as possible (rate = 1). Although speed 11 provides faster sheeting rates, accuracy is sacrificed.

ENTERING ACCELERATION / DECELERATION RATE

The "R" key is used to initiate a change of the accel/decel rate. The red "RATE" indicator must be illuminated. If the indicator did is not on, press the "R" key again The "RATE" value reflects the period of time required to obtain full speed and the return to zero speed. A larger value will require a longer time to reach top speed. To change the value, press the "R" key to display the current rate setting. Press the "CLR" key to zero the current value followed by entering a new rate setting. Press "ENTR" when finished. The allowed value range is 1 to 10. When operating in speed 11, the "RATE" value is forced to one.

The speed selection should be based on the requirements of the incoming material web. First, if the material being processed is stiff and not susceptible to damage, the fastest accel/decel rate of 1 can be used. If the material is more fragile, more time is required, so set the "RATE" value to a larger value. Materials that have a tendency to stretch may require a rate of 10.

CLEARING TOTAL COUNTER

The total counter can be viewed and cleared as required. When entering the batch count, the internal batch counter is cleared to zero. Pressing the "BATCH - ENTR" key sequence clears the current total, while keeping the current batch value. To view, press the "I" key. The total indicator should illuminate and the top display will show the current total. The current total can be viewed during automatic operation if it is selected prior to starting automatic operation. Unlike other function keys, a new value can't be entered for the total.

Displayed Information

The operator control panel contains various methods of displaying information. Two windows containing five LED digits are used to view numeric information. Eight LED indicators located next to the keyboard, give the current operating status of the system.

TOP DISPLAY INFORMATION

The top display, referred to as the function display, is the primary LED display. This display typically shows the currently selected function: Length, Batch count, sheet Total, increment Speed, or the accel/decel Rate. The value currently being displayed will have its indicator illuminated next to its keypad key. During some operations the display is used to provide additional information, but will return to normal after the operation is finished. "HELP" codes are displayed in this window when a failure has been detected by the system. The definitions of the help codes can be found in section 7.1.

BOTTOM DISPLAY INFORMATION

The second display window typically shows the current programmed length. However, during some operations, it may be used to temporally display values other than programmed length.

Manual Functions

Manual controls of feeding and cutting operations are provided by the system. The hydraulic pump must be active before any manual functions will operate. Pressing the Manual Cut pushbutton will initiate one full cut cycle. The increment roller will rotate forward while the "MANUAL FEED" push button is being held.

Warm Up

A feature is provided to bring the hydraulic oil temperature to proper operating levels when operating in cold climates. The warm-up function circulates oil through the system to warm the oil. Pressing the "CLR-ENTR-TOTAL" key sequence starts the warm-up sequence. The number displayed in the top window represents the number of 30-second intervals remaining. After approximately 15-minutes, the oil will be at the proper operating temperature.

Calibration

The CompuSheeter requires daily calibration. To start the calibration function, press the "CLR-ENTER-GO" key sequence. The calibration process compensates for tolerance variations of the material feed components. Because the process records information for different increment speed and rate requirements, the CompuSheeter should only be calibrated following the Warm-up function.

Before calibration, insure that material is removed from the CompuSheeter Increment Rollers.

The process rotates the increment roller and reads the frequency generated by the transducer while recording the correct duty cycle to achieve each speed. The lower window of the operator interface displays the current speed being analyzed, the upper displays diagnostic information. Once all speeds have been calibrated, the process is completed and the increment roller set is slowed to a stop.

A HELP8 error indicates a failure in the calibration process. All speed data is invalid and therefore unusable.

If the CompuSheeter requires calibration, a HELP7 is displayed when attempting to run.

Single Cycle Operation

Pressing the "Manual - Go" sequence, will process a single sheet. This function is useful for verifying proper length measurements before cutting a large quantity of sheets. After the cut cycle, the "Manual" and "Go" indicators are turned off. The total counter will be incremented after the cut cycle finishes. Pressing the "Total - Manual - Go" key sequence will provide an active total count. Be certain when verifying increment lengths that the leading edge of the sheet is flush to the edge of the lower blade.

Automatic Cycle Operation

Pressing the "Auto" key followed by the "GO" key will measure and cut multiple sheets. The number of cuts is determined by the "Batch" value. After each cutting cycle, the Total counter is incremented. Once all sheets are cut, the "Go" and "Auto" indicators are turned off and the machine stops. Pressing the "Total - Auto - Go" key sequence will provide an active total count.

Auxiliary Control Panel

The Auxiliary Control Panel is located on the operator end of the CompuSheeter, Figure 11 illustrates the layout of the panel.

Figure 14: CompuSheeter Auxiliary Control Panel

Nip Roller

The CompuSheeter is available with several styles of Nip Roller control, Mechanical Lever and Pneumatic Cylinder. A Dual Pneumatic Cylinder, (Upper and Lower) is also available.

MECHANICAL LEVER

Placing the Nip Roller Open /Close lever in the Open (up) position will raise the Sheeter Nip Roller to the full up position. Placing the lever in the Close (down) position will lower the Nip Roller.

Brake Control

MANUAL PNEUMATIC BRAKE*

Master roll breaking action is supplied by a pneumatic disk brake located on the Unwind module. Unwind Brake pressure is determined by the pressure regulator located on the Unwind Stand, the regulator /gauge set on the Auxiliary Operator Control Panel determines the maximum pressure available to the Brake unit. To increase the amount of web tension, turn the black knob labeled "Brake" clockwise, to decrease the amount of web tension turn the black knob counterclockwise.

For more information about the Manual Pneumatic Brake System, see Section 3 Overview.

DANCER LINKED BRAKE*

Master roll breaking action is supplied by a pneumatic disk brake located on the Unwind module. Unwind Brake pressure is determined by the pressure regulator located on the Unwind Stand, the regulator /gauge set on the Auxiliary Operator Control Panel determines the maximum pressure available to the Dancer Linked Brake regulator. To

* Indicates optional equipment that is not available with each installation.

increase the amount of web tension, turn the black knob labeled "Dancer" clockwise, to decrease the amount of web tension turn the black knob counterclockwise.

For more information about the Dancer Linked Brake System, see Section 3 Overview.

Dancer

The material Unwind Dancer will allow the CompuSheeter increment roller to briefly stop for a cut cycle without stopping the master unwind roll. Increasing Dancer tension will increase the web tension between the Feeder Nip set and the CompuSheeter Increment Nip set.

Placing the Dancer Load/Run switch in the Load position will raise the Dancer Arms and Roller to the full up position for ease of threading. When placed in the Run position the Dancer Arms and Roller will lower to the run position applying pressure to the material web. A pressure gauge is located above each Regulator that indicates the pressure applied to the respective Dancer Assembly.

Proper web tension pressure is achieved when the dancer is active without reaching either full travel limit while allowing the material to feed without slipping in the nip roller.

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Preparation & Operation

Before operating the CompuSheeter, a small amount of preparation is necessary. The following Subsections discuss the common practices and procedures for loading and setup of the equipment. Many options are available with the CompuSheeter this Manual may contain information that does not apply to each installation.

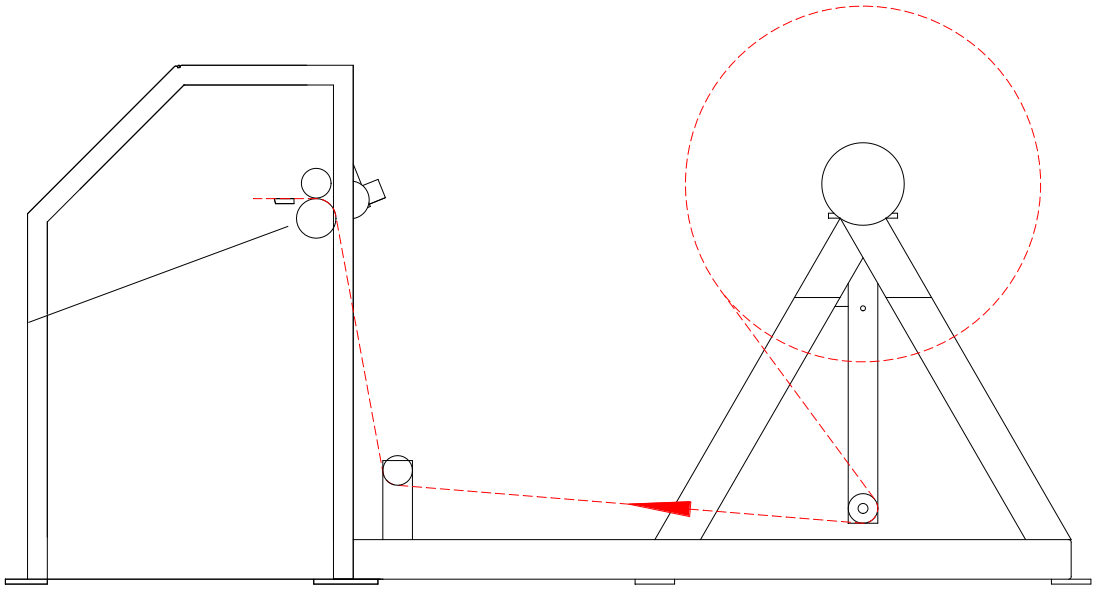

Figure 15: CompuSheeter Side View with Material Thread Up

Unwind

The following steps represent the typical unwind setup procedure.

1. Refer to Section 0 Material Core Support for detailed directions about your exact unwind stand.
2. Thread the CompuSheeter as shown in Figure 15.
3. Place the Nip Roller lever in the Close position.

Slitters

The following represents the typical slitter setup procedure.

1. Thread the material web as shown in Figure 15: CompuSheeter Side View with Material Thread Up.
2. Align the slitter bodies relative to the material to provide the desired slit width.
3. Insure that the Slitter Knives are extended.
4. Loosen the Slitter Mount Tube locking knob Figure 10: Typical Razor Slit Configuration.

Sheeter

Preparation of the CompuSheeter will require the entry of the run variables (length and batch data).

The following represents the typical CompuSheeter setup procedure.

1. Apply main power to the CompuSheeter, locate the Safety Disconnect Switch and place the red lever in the on (up) position.
2. Insure the Safety Guards are in the run position.
3. Turn the Power Switch to the on position.
4. Press the Reset pushbutton.
5. Press the Batch key to access the batch function.
6. Enter the desired number of cut parts, for Stacker* setup, press the 1 key, entering a batch of one.
7. To view or edit the Length, Speed, or Rate values, see Section 0 Entering Numeric Data.

* Indicates optional equipment that is not available with each installation.

8. To view a total count during operation, press the Total key before pressing the Manual or Auto keys.
9. To start the machine in the Manual mode press the Man key followed by the Go key, the CompuSheeter will increment and cut one sheet of material.
10. To start the machine in the Automatic mode press the Auto key followed by the Go key, the CompuSheeter will increment and cut material sheets according to the operator entered values.

Maintenance

This section outlines the techniques for locating problems within the system, and maintenance requirements.

General

The following Subsections contain useful information pertaining to maintenance procedures for various drive system components. Though not all of the items discussed apply to every machine, the information is general and applies to the basic principles of the various items.

Synchronous Belt Drives (timing belt drives)

Service all belt drives only when it is safe to do so. In most cases, turn the electrical and pneumatic power to the equipment off and install an electrical lockout on the power disconnect device. In the remaining cases, the drive may be visibly inspected (but not serviced) with all guards and safeties installed and operating properly.

Timing belts should be installed with a snug fit, neither too loose nor too tight. High initial tension is not necessary but when shaft torque is too high a loose belt may "jump grooves." In such case, the tension should be gradually increased until satisfactory operation is attained. Excessive tension wears out the belt quickly and decreases bearing life.

Be sure that the shafts are parallel and pulleys are in alignment. When the distance between shaft centers is long, because of the tendency for the belt to run against one of the pulley flanges, it is sometimes advisable to offset the driven pulley to compensate.

Belt tension requires little attention after initial installation. When changing belts, do not force the belt over the flange of the pulley. This could damage the cords within the belt.

An increase in noise level could indicate either belt or pulley wear. Visually inspect the teeth on both. Worn pulley teeth greatly decrease belt life. Also, check the belt for cord exposure.

Make sure that the driver and driven units are tightly mounted. Loose bolts in either can cause timing belt tension variation resulting in premature wear or loss of increment accuracy.

Never apply any chemicals (belt dressing) on any belt drive. This will only damage the belt and cause slipping and early failure. Keep belts free from foreign material.

V-Belt Drives

Service all belt drives only when it is safe to do so. In most cases, turn the electrical and pneumatic power to the equipment off and install an electrical lockout on the power disconnect device. In the remaining cases, the drive may be visibly inspected (but not serviced) with all guards and safeties installed and operating.

Be sure that the shafts are parallel and pulleys are in alignment.

The ideal tension is the lowest tension at which the belt will not slip under peak load conditions. A short "chirp" noise at machine startup is normal, but continuous belt squealing indicates either too loose of tension or worn belts and pulleys.

It is a good idea to check the tension frequently during the first 24-48 hours of operation. Make a periodic v-drive inspection afterwards (every 30 days).

Over tensioning shortens belt, pulley, and bearing life.

Keep belts free from foreign material, which may cause slippage. Never apply any chemicals (belt dressing) on any belt drive. This will only damage the belt and cause slipping and early failure.

Visually inspect belts for cracking, splitting, and cord damage. Replace them if they have any damage.

Inspect the pulleys for wear. Use a straightedge to check to see if the sides of the pulley v-groove are flat. The pulley must be replaced if they are not.

Make sure that the driver and driven units are tightly mounted. Tighten any loose bolts.

When installing new belts, never force the belt over the sheave. More belts are broken from this cause than from actual service. Always loosen the belt tensioner or other drive component to allow the belt to be easily slipped into place by hand.

When installing new pulleys (sheaves) never drive them on or off the shafts with a hammer. Be sure that the shaft and keyway are smooth and free from burrs or setscrew marks. Remove these burrs by dressing lightly with a finishing file. Tighten screws carefully and recheck tightness after eight hours of operation. Installation and tightening instructions are nearly always included in the pulley package; sometimes they are printed on the inside surface of the box.

On drives that have more than one belt, replace all the belts with a matched set of new belts. Failure to do this will probably result in the premature breakage of new (and probably shorter) belts mixed with old ones.

Store extra belts in a cool, dry, dark place.

Lubricating Mounted Bearings with Grease Zerks

Lubricate bearings only when it is safe to do so. In most cases, turn the electrical and pneumatic power to the equipment off and install an electrical lockout on the power disconnect device. In the remaining cases, the bearings may be lubricated with all guards and safeties installed and operating.

The proper amount of lubricant in a bearing is important. Both excessive and inadequate lubrication may cause bearing failure. The bearings should be lubricated while they are rotating if it is safe to do so. The grease should be pumped in slowly until a slight bead forms around the seals. This bead in addition to acting as an indicator of adequate lubrication, provides additional protection against the entry of foreign matter and helps flush out contaminates in the bearing. Excess grease can be removed by removing the grease fitting and allowing the grease to escape.

By the time the slight grease bead is formed, it will be noted that the bearing temperature will rise. It is not uncommon for the temperature to rise as much as 30° F after re-lubrication. If it is necessary to re-lubricate while the bearing is idle, use the following table for approximate grease charges.

Shaft Size (inches)	Grease Charge (ounces)
1/2 to 3/4	0.03
7/8 to 1-3/16	0.10
1-1/4 to 1-1/2	0.15
1-11/16 to 1-15/16	0.20
2 to 2-7/16	0.30
2-1/2 to 2-15/16	0.50
3 to 3-7/16	0.85
3-1/2 to 4	1.5

Table 3: Mounted (Cast Iron Housing) Ball Bearings Lube

All bearing units are normally pre-lubricated at the factory. The lubricant is usually a highly refined mineral oil with a lithium soap thickener to conform to NLGI Grade-2 consistency. Additives that protect against corrosion of the metal parts and oxidation of the lubricant are also included. Local bearing suppliers can provide good multi purpose grease that is compatible with these specifications. The following table provides a frequency of lubrication depending on operating conditions. Remember that bearing operating temperature is the best index for determining a lubrication schedule.

Speed (rpm)	Temperature (°F)	Cleanliness	Interval
100	Up to 125	Clean	6 mos. to 1 year
500	Up to 150	Clean	2 months
1000	Up to 210	Clean	2 weeks
1500	Over 150	Clean	Weekly
Any	Up to 150	Dirty	1 to 4 weeks
Any	Over 150	Dirty	1 to 7 days
Any	Any	Very dirty	1 to 7 days
Any	Any	Extremely dirty	Daily

Table 4: Bearing Lubrication Frequency

Roller Chain Drives

Service and inspect chain drives only when safe to do so. In most cases, turn the electrical and pneumatic power to the equipment off and install an electrical lockout on the power disconnect device. In the remaining cases, the drive may be visibly inspected (but not serviced) with all guards and safeties installed and operating.

Visually inspect periodically and make sure that shafts are parallel and sprockets are in line with each other. Check to see if the sprocket teeth are deformed, and check the chain for looseness.

Replace a worn out chain with a complete new chain and new sprockets. A new chain should be installed with light tension, as it will elongate a small amount due to the seating of the pins and bushings during the first few days of operation. A smooth operating chain drive should have a slight sag in the chain. Sprockets should be replaced with identical units as Contech uses sprockets with hardened teeth extensively.

Most roller chain drives used in Contech equipment require manual lubrication. The roller chain should be kept in good condition by proper lubrication and occasional cleaning. Clean the chain and sprockets by wiping off the contaminants. Lubricate the chain using oil specifically designed for roller chain. A local bearing supplier can provide the proper chain oil and other chain cleaning products.

Shaft Couplings

Service all shaft couplings only when it is safe to do so. In all cases, turn off the electrical and pneumatic power to the equipment and install an electrical lockout on the power disconnect.

Shaft couplings are used primarily to connect two rotating shafts together. Various styles are employed depending on the physical requirements. Jaw, flex disc, bellows, beam, and rigid type couplings are used by Contech, and they usually need only occasional visual inspection for looseness and insert integrity. Once properly installed, couplings generally give good service for the life of the equipment with very little maintenance required. Inspect couplings once every 6 months to a year.

Gear reducers usually have a bellows, or jaw style coupling attached to the input shaft and a rigid, or flex disc coupling attached to the output shaft. In order to inspect the input shaft coupling, the attached motor may

need to be removed thereby exposing the coupling. An inspection opening is sometimes present in the reducer's motor adapter housing. This opening allows the coupling to be inspected and tightened. Remember that a loose coupling or damaged insert will adversely affect the increment accuracy.

Electrical encoders use beam style couplings, which rarely require maintenance.

Gear Drives (gear reducers / boxes)

Service all gear reducers only when it is safe to do so. In all cases, turn off the electrical and pneumatic power to the equipment and install an electrical lockout on the power disconnect.

Gear reducers are filled at the factory with lubricant and generally need no maintenance other than checking the lubricant level and checking the looseness of the gear set. Gear reducers have either a level plug or a "bulls-eye" sight glass to indicate oil level. Replacing the shaft seals can sometimes repair leaking gear reducers. Excessive looseness or "backlash" in the gear set adversely affects increment accuracy.

Individual gear reducers have their own lubrication requirements. Contech uses Mobil SHC synthetic gear oil in Boston, Cone, and Winsmith gear reducers. Other gear reducers have individual specifications and requirements. Consult the gear reducer manual for specific recommendations. Never mix brands of gear oils together. If unsure of the exact kind of gear oil that is in a gear reducer, drain the old oil completely and refill with the proper oil.

Some gear reducer manufacturers recommend that the oil be changed at the end of 2 weeks operation and then again after every 2500 hours of operation. This frequency of lubrication change will ensure long life. Again, check the individual manufacturer documentation for specific instructions.

Gear reducers in normal operation can generate temperatures up to 200°F depending on the type of reducer and the severity of the application (loading, duration of service, ambient temperature). At these high temperatures, the service life is reduced. Excessive reducer temperatures can be the result of overload, inadequate cooling, or overfilling or under filling with oil. Air must be allowed to circulate freely around the equipment.

During normal operation, the heat generated by the gearbox will cause air and lubricant to expand. A vent plug is used on some units to equalize the resulting pressure. Check the vent plug, if present, for blockage and proper operation.

Electric Motors

Service all electric motors only when it is safe to do so. In all cases, turn off the electrical and pneumatic power to the equipment and install an electrical lockout on the power disconnect.

Nearly all electric motors are permanently lubricated at the factory. Exceptions to this rule are large electric motors with specific lubrication instructions.

Permanent magnet DC motors are usually equipped with brushes. These need to be inspected after every 1000 hours of operation. When they shorten to a specific length, replace them with new ones. The individual motor manual will indicate minimum brush length dimensions. DC servomotors are brushless, and are normally maintenance free.

Elevated motor temperatures beyond the motor's nameplate value may indicate overload caused by binding drive system components, or inadequate cooling. Keep all motors clean, free from debris, and dry. Periodically monitoring the amp draw of each motor is a good indicator of overall machine condition.

Pneumatic Systems

Service pneumatic components only when it is safe to do so. In all cases, turn off the electrical and pneumatic power to the equipment and install an electrical lockout on the power disconnect. Be aware that residual air pressure may still exist somewhere in the machine, even after the air lines have been disconnected. This residual air pressure may cause part of the machine to operate resulting in a dangerous condition.

One of the most important pneumatic components used with Contech equipment is the filter regulator. The filter regulator provides two basic functions. It reduces the air line pressure to that which is required by the machine. It also filters water and particulate matter from the compressed air. Water and dirt are the leading cause of air component malfunction. It is very important to visually check weekly the sight bowl at the bottom of this unit. A drain (possibly self-draining) will allow the water to escape the system. The filter element is also visible in the sight bowl. Auxiliary water traps may need to be installed if conditions (high humidity or large air requirements) warrant.

This filter regulator may be combined with a lubricator, which will need periodic refilling of air line oil. The lubricator is only used when specific devices require it. Instructions on how to maintain the lubricator, if installed, will be included in the manual addendum.

Electric solenoid valves use an internal spool that shifts back and forth electrically thereby directing pressurized air to the proper air device. These spools can become stuck in place due to foreign matter or moisture in the air lines. A long period of inactivity can also cause partial or complete sticking. If cycling the valve a few times does not clear the blockage, it will be necessary to disassemble the valve and clean it. Contech uses illuminated electrical connectors frequently to provide a visual indication of electrical power to the valve. A burned out solenoid coil can also cause the spool to not move. Valves do not need lubrication (or a lubricator) in order to function properly.

Mufflers are used on both air cylinder ports and valves. They are used to quiet machine operation, control the flow of air, and keep foreign particles out of the system. It is possible for these to become clogged on the inside surface. This is caused by contamination from deteriorating air lines, failing components, or dirt in

general. A clogged muffler can cause a valve to not shift or a cylinder to move slowly or not at all. This is not visible from the outside, and the muffler will appear to be perfectly normal. Remove the muffler and either clean or replace it.

Air cylinders are used to provide linear motion power. Rotary actuators are used to provide rotary motion power. Both of these types of devices require clean dry air and will provide long service with little or no maintenance. Sometimes they are equipped with adjustable cushions and/or flow controls (adjustable mufflers). These controls provide smooth operation and long life if adjusted properly. Eventually the piston and rod seals will wear and the machine will suffer performance degradation or cease to function. At this time it is sometimes more economical to replace the actuator rather than repair it.

Vacuum systems rely on a vacuum source (pump) for power. Pumps are usually of the piston type, requiring periodic oiling, or of a venturi type, those require clean dry compressed air. The operator's manual for the piston pump, if installed, is included in the addendum. Venturi vacuum generators are very sensitive to dirt and have no moving parts. They can be easily disassembled and cleaned.

Clutches and Brakes

Service all clutches and brakes only when it is safe to do so. In all cases, turn off the electrical and pneumatic power to the equipment and install an electrical lockout on the power disconnect.

Brakes are used stop rotary motion or to drag rotary motion (provide web tension for instance) in Contech equipment. They may be either electric or air powered or even simply a leather strap placed over a drum. Electric brakes come in two styles, friction disc, or magnetic particle. Air brakes also come in two styles, disc caliper or friction disc. Maintenance is simple; replace the friction discs, linings, or pads when they are worn out. The linings or pads are sometimes visible without having to disassemble the unit. It is possible for the rotors to wear also. Replacement of the entire brake assembly should be considered when both the rotors and the friction media are worn. Magnetic particle brakes should have the particle media replaced yearly.

Clutches are similar to brakes in principle. They are employed to disconnect rotary power for an amount of time. They are also used to provide a constant slipping transmission of rotary torque to a shaft. Construction and maintenance is the same as for brakes.

Clutch/brake mechanisms are used to provide a cyclic power pulse to rotating machinery. Contech uses an oil shear device manufactured by Force Control. This device uses liquid as the friction media and is very hardy. When the air controls are properly adjusted, they require little or no maintenance.

Scheduled Maintenance

Every **30** days.

Clean rollers
Clean blades
Check hydraulic fluid level
Note run-time on hydraulic fluid

Every **1,000** Hours of operation.

Lubricate bearings on the main electric motor (M1), the blade mechanism, the Unwind Stand, and the conveyor system. (Lithium multipurpose lubricant)
Do not over-lubricate

Every **2,000** Hours of operation.

Replace hydraulic oil (Mobil DTE 15 or equivalent)
Replace hydraulic oil filter (LHA SPE-15 or equivalent)
Check full load current draw of all AC & DC electrical motors (not to exceed the current rating on the component ID plate)

Pump Type	Pressure
Standard Gear	475 to 525-psi
Heavy Variable Piston Displacement	800 to 950-psi

Table 5: Hydraulic Power Unit Operating Pressures

Hydraulic Power Unit

Hydraulic technology is used to perform the increment and cutting functions of the CompuSheeter. Oil is pumped through a hydraulic system to generate movement. The hydraulic power plant generates the oil flow and pressure required for operating the CompuSheeter. The basic components of the power plant are the oil tank, pump, electric motor, and valve manifold. Additional features are provided with purchased options.

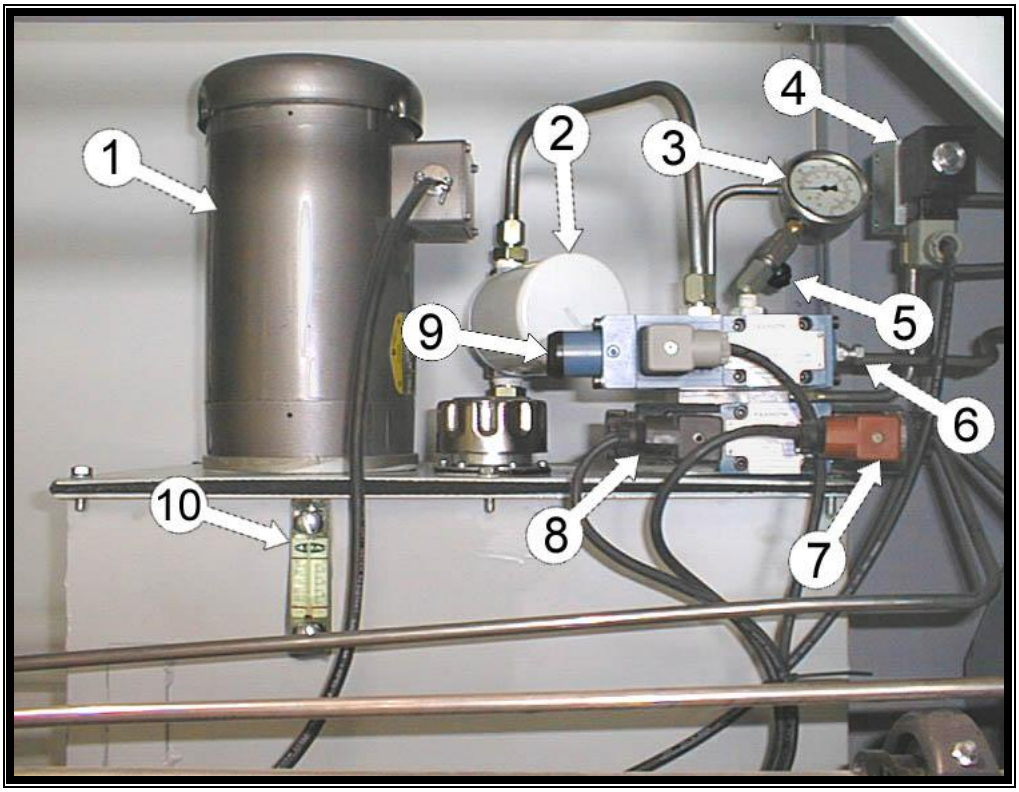

Figure 16: Standard Hydraulic Power Unit

Item	Description
1	Pump Drive Motor
2	Return Filter *(LHA SPE-15 or equivalent)*
3	Pressure Filter
4	Pressure Dump Valve
5	Pressure Gauge Snubber Valve
6	Pressure Relief Valve
7	Cutter Blade 1 Valve
8	Cutter Blade 2 Valve
9	Increment Roller Manual Push Plunger
10	Oil Level & Temperature Gauge

Table 6: Standard Hydraulic Power Unit Components

Accessing the Power Unit

The power unit is located below the cutting blade assembly, access to the unit may be gained by removing the rear panel from the CompuSheeter.

Standard Hydraulic Power Unit

Figure 8 provides a physical detail of the hydraulic power unit. The typical electric motor is a 220VAC 1-½ HP single phase. However, optional hydraulic drive motors are typically ordered, including 220/440-VAC, 3-☛, 2-HP. The electrical control of the motor is provided from the electrical control box mounted on the lower right side of the CompuSheeter. A flow distribution manifold is located on the power unit. The manifold provides a common mounting location for the hydraulic tubing. Three electrically operated control valves are located on the power unit to control oil flow. The standard unit contains two pressure gauges. One gauge is mounted across the oil filter to measure pressure drop across the filter, and thus cleanliness of the filter. The second pressure gauge gives the regulated system pressure.

The cutting system valve, mounted to the manifold, operates the rotary actuator used by the cutter system. The valve is a three-position, four-way valve, requiring two control coils. When neither coil is energized, oil flow to the rotary actuator is inhibited. The coils control oil flow in opposite directions to the rotary actuator. These two valves are controlled by outputs OUT1 and OUT2 of the I/O board.

The proportional valve controlling the increment system is also mounted to the manifold. This valve only requires one coil to operate. This valve differs from standard control valves in that the oil allowed to pass through the valve is proportional to the electrical current applied to the control coil. This feature is required to control the operating speed of the increment roller. This valve coil is controlled by OUT6 of the I/O board.

The "dump" valve, mounted in-line above the manifold, provides low-pressure start-up for the pump system. The valve is energized allowing oil to flow freely back to the tank while starting the pump. The valve is controlled by OUT5 of the I/O board. When active, the pressure gauge will drop to near zero.

The oil filter gauge should be checked every 30 days to insure pressure drop across the filter is not excessive. The pressure should be checked when the oil is warm. The machine should be operating for 30 minutes prior to checking the gauge. The filter should be changed for any readings above 5 psi.

The system pressure gauge should also be checked every 30 days to verify that the proper operating pressure is present. When the oil is warm, the pressure for a standard duty unit should read between 475 -500 psi. The pressure adjustment knob is located between the proportional valve and manifold. A 9/16" and ½" open-end wrenches are necessary for adjustment. To adjust, loosen the 9/16" jam nut and rotate the ½" bolt clockwise to increase pressure. Counterclockwise rotation decreases the system pressure. Be sure to re-tighten the 9/16" jam nut between adjustments.

High Speed Power Unit

The high-speed power unit gives the ability to increment the material much faster. The pump system is capable of delivering a higher oil flow capacity. A pressure compensated pump design will operate at cooler than conventional designs. To deliver the required hydraulic power, a 3-↓ 2-Hp electric motor is used to drive the pump.

In-Line Power Unit

The in-line power unit has special provisions allowing it to interface directly with an external feed source. The enhancements allow the increment roller to enter a low torque mode once material is pulled tight. A pressure regulator is added to the system allowing a lower pressure to be applied to the increment roller when a control valve is energized. While the valve is energized, the hydraulic operating pressure is reduced, limiting the torque applied to the increment drive motor. Full operating pressure is restored when the control valve is released. Full pressure is required during cutting cycles.

Tank Capacities

The following formula may be used to calculate the oil requirements of any size tank. ("H"-1) * "W" * "D" = cu. In. / 231

The above formula allows one inch (1") of air above the fluid inside the tank.

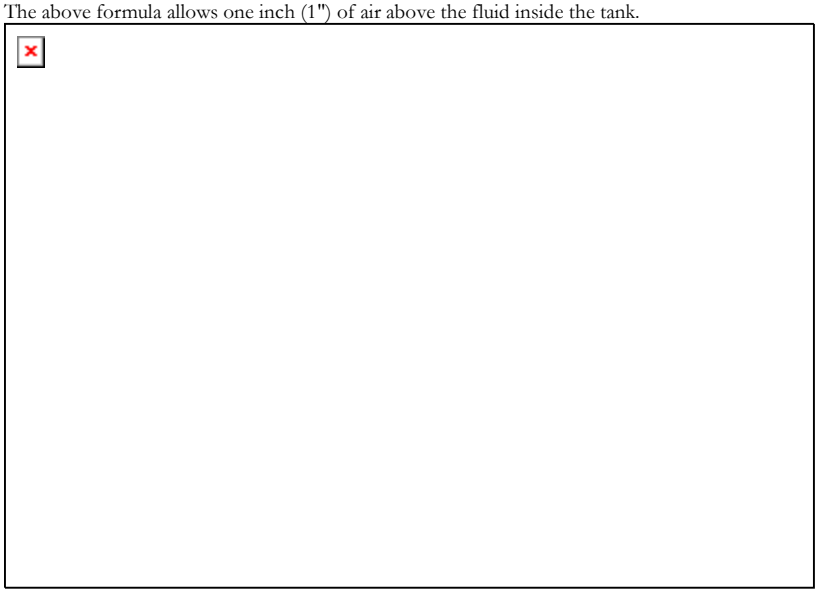

Figure 17: Hydraulic Reservoir Capacities

Pump	GPM	Suggested Capacity (US Gallons)
(RR) S16S5AH26R	2.9	10.0
(RR) A10VSO-18-DFR	8	30.0

Pump	GPM	Suggested Capacity
(RR) A10VSO-28-DFR	13	30.0
(RR) A10VSO-45-DFR	20	60.0
(RR) A10VSO-71-DFR	32	90.0
(RR) A10VSO-100-DFR	46	120.0
(RR) A4VSO-40-DRG	18	60.0
(RR) A4VSO-71-DRG	32	90.0
(RR) A4VSO-125-DRG	57	150.0

Table 7: Pump Reservoir Requirements

Filter Selection

When changing the hydraulic oil, a new oil filter should be installed as well. Because the characteristics of each hydraulic unit dictate the filter requirements for each unit may vary slightly. When purchasing a new filter, verify the Element Model # on the Filter Housing ID Plate.

Oil Filter Replacement

The oil filter is a spin on type located inside the CompuSheeter. The following steps represent a typical filter element replacement.

1. Insure the main electric power is locked out at the safety disconnect.
2. If available, place a small container (½ gal.) under the spin on filter.
3. Remove the filter by turning in a counterclockwise direction.
4. Lubricate the O-ring on the new filter with hydraulic oil and turning in clockwise direction install the new filter.

Pump Pressure

Typically, this adjustment is only necessary when the pressure relief valve has been removed and cleaned, it is not routine maintenance, and should only be performed by qualified maintenance personnel.

The following represents a typical pressure adjustment procedure.

1. Start the hydraulic pump.
2. Locate the Pressure Relief Valve Figure 7 Item 6.
3. Using a 9/16" open-end wrench, loosen the Pressure Relief Adjustment Lock Nut.
4. Using a ½" open-end wrench, while monitoring the pressure gauge, adjust the Stand-By Pressure Relief Valve to 500 to 525-psi. Verify that the current draw of the Pump Drive Motor does not exceed the motor ID Plate rating.
5. While holding the Adjustment Bolt with the ½" wrench, use the 9/16" wrench to tighten the Adjustment Jam Nut.

Oil Cross Reference

The following table offers a cross-reference of compatible oils from various manufacturers, contact your local distributor for additional information.[1]

ISO Viscosity	VG 46	
Fluid Manufacturer	HVLP	HLP
AMSOIL	RCI	RCI
AVIA	AVILUB HVI 46	AVILUB RSL 46
BP	Bartran HV 46	Energol HLP 46
CASTROL	HYSTIN AWH 46	HYSTIN AWS 46
D.A. STUART		Dasco PS 30 Dascolube AW 46 Hydrashield AW-SIO-68 Hydraulic AW ISO 68
ELF	HYDRELF DS 46	ELFOLNA 46 ELFOLNA DS 46
EXXON	UNIVIS N 46	NUTO H 46 HUMBLE HYD. H68
FINA	HYDRAN HV 46	HYDRAN 46
HYDROTEX	Systems 5K HV46	Systems 5K 46

[1] No recommendation is implied.

Kuwait Petroleum Q8	Q8 Händel 46	Q8 Haydn 46 Holst 46 Hydraulik S46
MOBIL	Mobil DTE 15M	Mobile DTE 25 Mobile Hydraulic Oil AW 46
SHELL	Shell Tellus Oil T 46 Shell Hydrol HV 46	Shell Tellus Oil 46 Shell Hydrol DO 46
TOTAL	Equivis ZS 46	Azolla ZS 46
SUN		SUNVIS 746

Table 8: Oil Cross-Reference

Computer Control System

Three boards are required to control the basic CompuSheeter system: the input/output board, the main board, and the display board. A multi-conductor ribbon cable makes the electrical interconnections between these boards. When making connections to the boards the proper cable orientation must be observed. Each cable is marked with a stripe, along one edge of the cable marking the number one wire. In the following drawing, the three boards are shown along with the orientation of the number one wire.

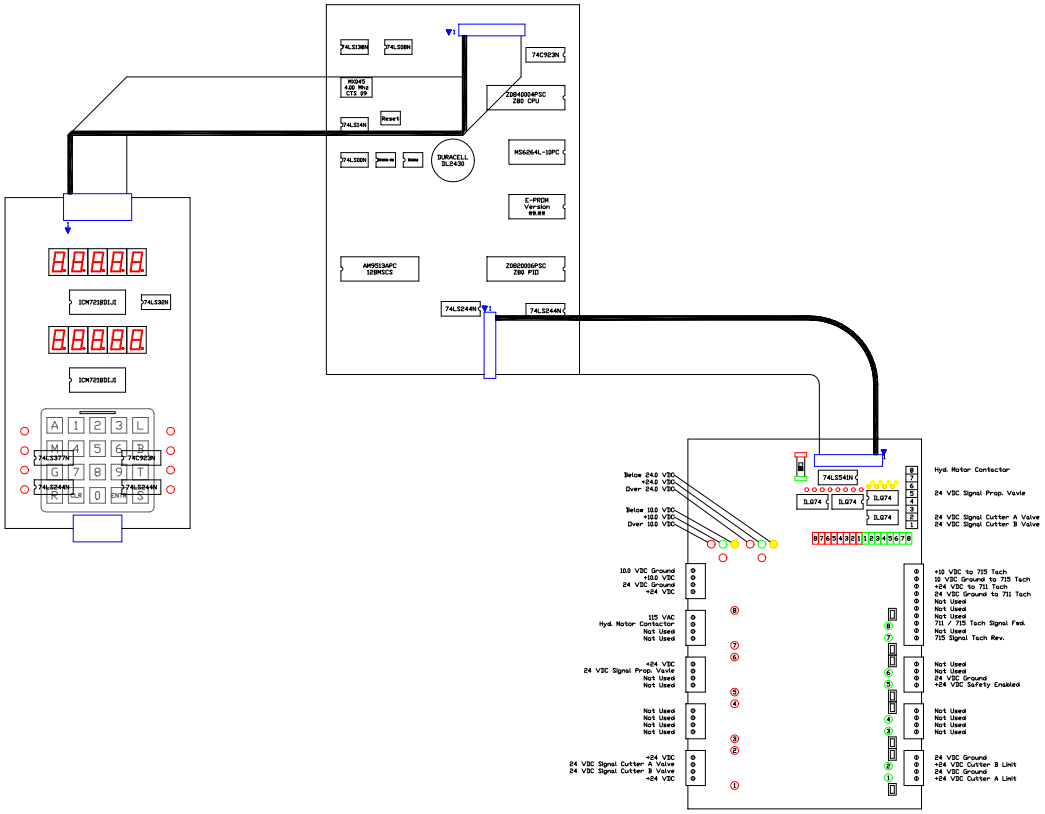

Figure 18: Computer Control Boards

Computer Control Boards

The main board represents the heart of the system. A microprocessor circuit and its operating program perform the actions necessary to operate the CompuSheeter system. The board is mounted in an enclosure located behind the display panel. This board is free of maintenance requirements with the exception of software updates and replacing the on-board battery. Replacing the EPROM chip containing the control program performs software updates. If other problems occur, the computer board should be removed and returned to Contech for service.

Removal and Replacement of EPROM

Occasionally, the control program may be modified to enhance the capabilities of the CompuSheeter. Replacing the Electrical Programmable Read Only Memory (EPROM) integrated circuit changes the program. This device contains the control program required to operate the CompuSheeter electronics.

The EPROM is static sensitive and precautions must be taken to protect the device from receiving an electrostatic discharge. We ship the EPROM in one of two forms: placed on a small pad of black conductive foam or placed in an anti-static plastic tube. The EPROM should remain in its packaging until immediately before placing it into the board. The packaging should then be used for the original control EPROM for shipment back to Contech or for storage.

Remove the electrical power from the CompuSheeter. Remove the display panel assembly by removing the four screws located in each corner of the display panel. Lift the panel straight up exposing a ribbon cable and a wiring harness connecting to the assembly. The electrical harness disconnects using a connector located at the bottom of the enclosure. Disconnect the ribbon cable from the computer control board mounted in the enclosure. Set the display panel assembly aside.

The EPROM is located on the computer control board mounted inside the enclosure behind the display panel. Using a small standard screwdriver, gently insert the blade between the EPROM and its mounting socket. Be certain that the blade is not between the circuit board and black mounting socket. Gently twist the screwdriver while extending it further under the socket and continue to lift the EPROM away from the socket.

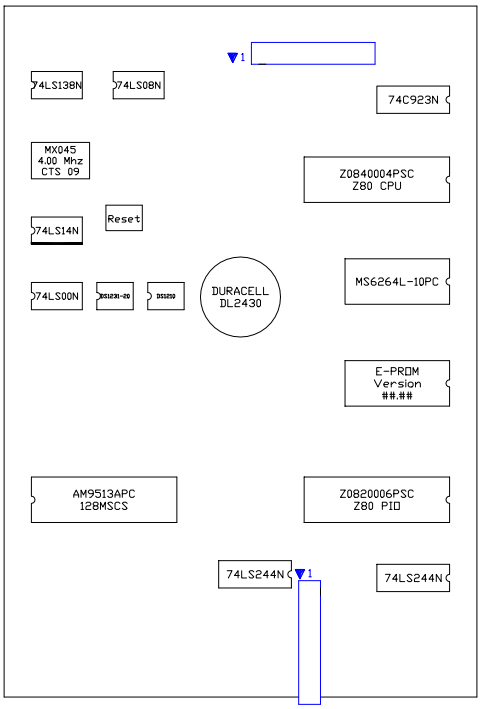

Figure 19: CompuSheeter Main Board

Unpack the EPROM and prepare to insert it into the board. Locate the EPROM by referring to Figure 9 and by the white paper label covering the top. A notch is placed on one end of the EPROM identifying the pin 1 end. The EPROM must be oriented such that the notch is located towards the edge of the board. Do not rely on the orientation of the writing on the label. Care must be taken when inserting the EPROM that the leads do not bend and all 28 pins are in the socket. Place 1 row of IC pins into the start of the socket, gently compress the rows of leads while starting the second row in the socket. When all leads have been started into the socket, firmly press the EPROM into the socket.

Repack the original EPROM as it was shipped. Reconnect the ribbon cable and wiring harness of the display panel assembly and mount the panel. Apply voltage to the CompuSheeter and test the EPROM.

Replacement of Battery

Located approximately in the center of the board is a small "coin" type battery (See Figure 9). To replace the battery, gently slip it sideways out of the holder. Replace with the same type of battery (Duracell DL2430). The battery must be replaced with the "+" terminal up. It is necessary to re-calibrate the system after the battery has been replaced (See Section 5.1.5).

Removal and Replacement of Main Board

Removal of the computer control board is done as follows. Remove power to the system. Remove the four screws holding the display panel assembly to the cabinet and carefully lift the assembly. Disconnect the black

round connector from the box housing by rotating its locking ring counter clockwise. Disconnect the ribbon cable from the computer board that routes to the display panel assembly. Set the display panel assembly aside. Remove the ribbon cable connecting the main board and the input/output board. The main board is mounted internally with four plastic mounting clips. Compress the clip lock extending above the board and carefully lift the board above the latch. Do this for all four locations and remove the board. Place the board into plastic anti-static bag, or wrap board in aluminum foil before shipping. Reverse this process to reinstall the board. Insure that the ribbon cables are installed correctly as described in section 7.4.

Display Board

The display board, located behind the operator panel, contains the two LED displays, keypad, and eight LED function indicators. There are no user serviceable components located on this board. The board, however, may need to be removed for return to Contech.

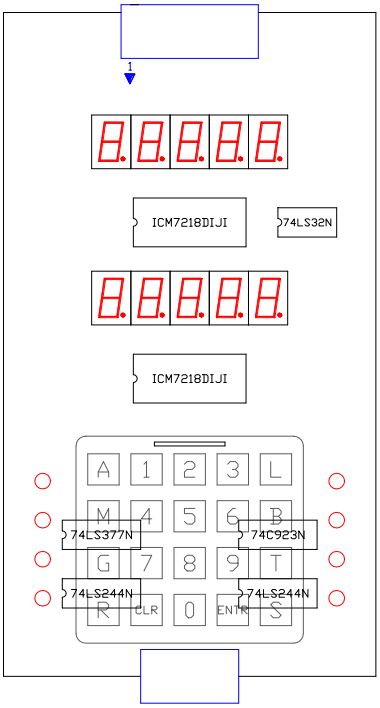

Figure 20: Display Board

REMOVAL AND REPLACEMENT OF DISPLAY BOARD

Removal of the display board is done as follows. Remove power to the system. Remove the four screws holding the display panel assembly to the cabinet and carefully lift the assembly. Disconnect the black round connector from the box housing by rotating its locking ring counter clockwise. Disconnect the ribbon cable from the display board that routes to the computer control board. Disconnect small ribbon cable connecting to switches mounted to polycarbonate panel. Remove the four screws located around the keypad area and separate the board from the polycarbonate panel. Place board into plastic anti-static bag, or wrap board in aluminum foil prior to shipping. Reverse these procedures for reinstalling the display board. Insure that the ribbon cables are connected properly as described in section 7.2.

Input / Output Board

The input/output (I/O) board collects and conditions the signals between the computer and the field devices. Field devices are those electrical components located outside of the control box. All field sensors connect to the input channels, and all valves and power contactors controlled by the computer connect to the output channels. The wiring diagrams contained in the appendix detail the electrical connections made to the I/O board.

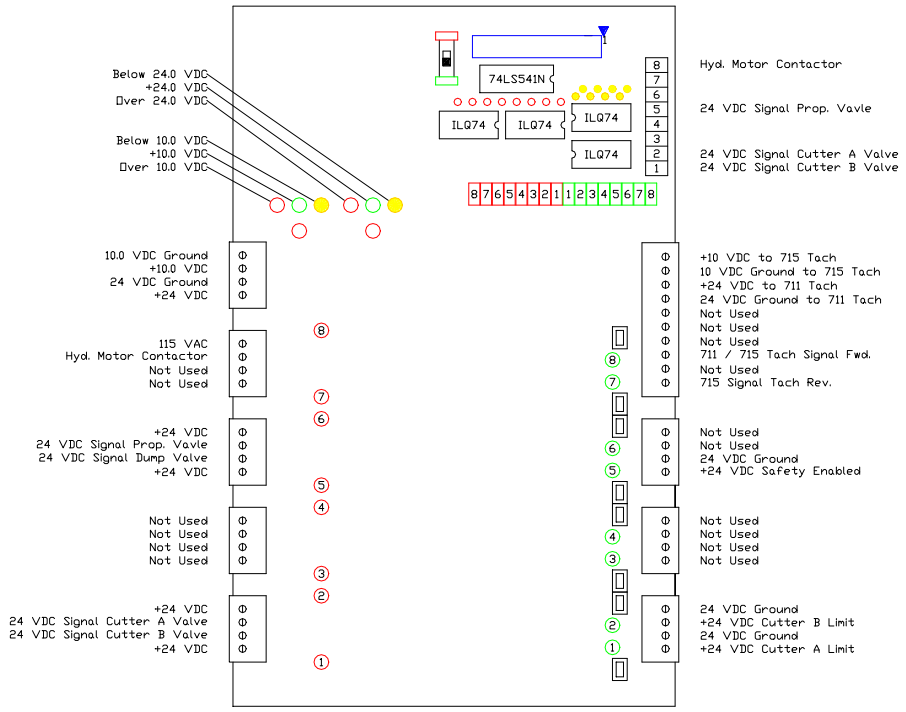

Figure 21: I-O Board

CAUTION

The Input / Output Board Contains High Voltages, Avoid Contact with the Board, and the Wiring Connected to It!

STATUS INDICATORS AND TESTING CIRCUITS

The I/O board design includes features to assist locating failures in the external wiring or field components. The green input and red output LED's located by the wiring connectors provide the primary indicators for the field wiring. Two additional LED's per channel are included for detecting failures in board level components. Small LED's located above the ribbon cable connector, represent output and input signals being transferred to the main computer board.

Push button switches are located on the board to simulate the inputs and force outputs. When one of the black push buttons are pressed, the input channel signal is forced true. The black push buttons control the output channels. The small slide switch located next to the ribbon cable must be in the on position activating the red LED beside it before the push buttons operate. If the safety guarding system is not in place, some output channels will not operate their field device. The following sections describe how to use these controls to diagnose problems.

Note:

If the external signal is also true, the push-button has no effect.

POWER SUPPLY STATUS INDICATORS

Two separate power supply status indicator circuits are provided on the I/O board. The four indicators provide information for reverse polarity, low, high, and normal voltages. The top red indicator represents a reverse polarity power supply connection. The yellow indicator is illuminated for low voltages, the bottom red indicator for high voltages, and green when the supply voltage is within range.

The two separate power supplies, located in the electrical control panel, should be checked periodically using a digital voltmeter. The adjustments are located on the power supply assemblies and are marked as VOLT. Placing the voltmeter on the I/O board power supply connector, measure the voltage. Adjust the 1OV supply to 10.10-VDC. Adjust the 24-VDC supply to 24.75-VDC.

Increment System

The increment system consists of an increment roller directly driven by a hydraulic motor, a proportional control valve, a length encoder, and the control electronics. The hydraulic motor converts oil flow and pressure into rotational speed

and torque. Braking action is also provided at the motor by restricting or stopping the oil flow. The high system pressure generated from the hydraulic power unit can generate Very high torque. The proportional control valve (located on the power unit manifold) provides oil flow to the motor. Modulating the current flow through the valve controls the orifice size and thus controls the speed of the roller. Although the motor is capable of rotating in both directions, the valve only provides oil flow in one direction and thus only forward rotation is available. The computer controls the current being supplied to the control valve. An encoder, mounted to the input guard, returns position information to the computer. The program and controlled electronics of the main board calculate all the material increment length, rotational speed, and acceleration of the material.

Cutting System

The cutting system uses a hydraulic rotary actuator to control the blade movement. To perform a single cut, the rotary actuator must rotate one 360° revolution (rotation direction is not critical). During the rotation, the blade is pulled down and then lifted and held at top-dead-center (TDC). An electrically operated hydraulic valve directs the oil flow into a counter balance valve before passing to the actuator. The counter balance valve is an adjustable pilot operated check valve for the return line, and allows unrestricted flow to the actuator for the pressure line. By restricting return oil of the actuator, speed and force of the blade can be maintained throughout the entire cut cycle. Internally, a piston is forced back and forth through the actuator cylinder by oil flow supplied by the control valve. Oil is forced into opposite ends to move different directions. The piston translates its linear movement to the externally rotating shaft by rack-and-pinion action. Magnets are mounted on the internal piston to provide position sensing. Movable sensors, mounted externally, are engaged when these magnets pass under them. Two sensors are used in the CompuSheeter to provide end-of-travel limits for the actuator.

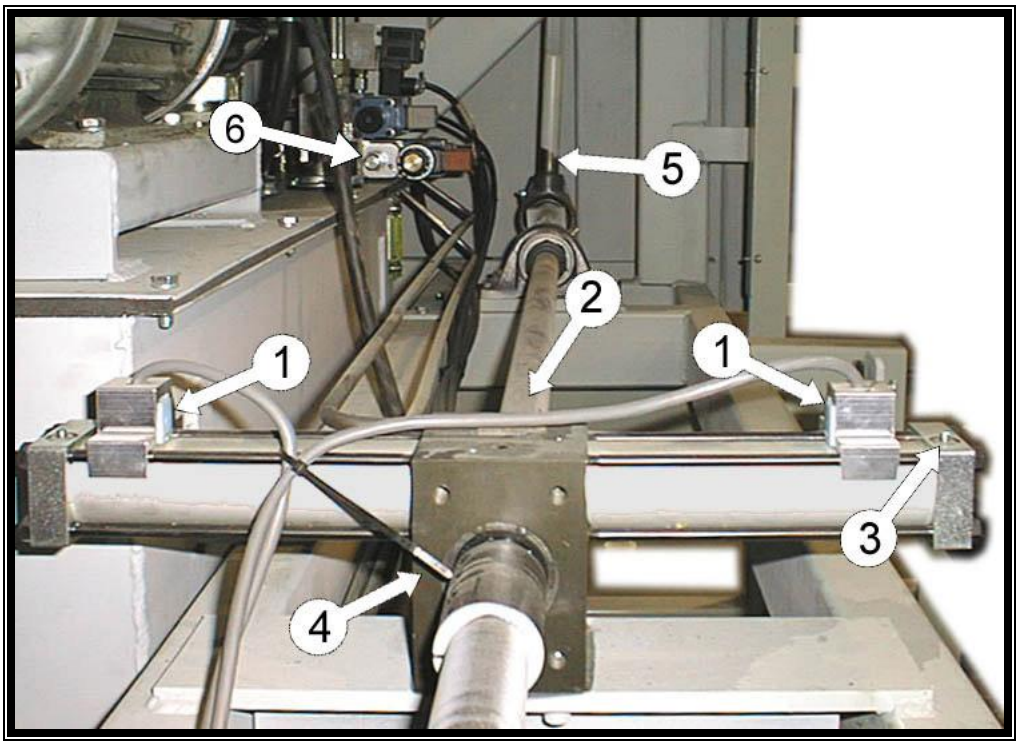

Figure 22: Cutter Drive Components

Item	Description
1	Cutter Actuator Magnetic Limit Switch
2	Cutter Blade Drive Shaft
3	Cutter Actuator End-of-Stoke Cushion
4	Cutter Hydraulic Actuator Adjustment
5	Cutter Blade /Drive Connecting Rod

Table 9: Cutter Drive Components

The double-ended hydraulic valve controls oil flow to the cutting system actuator. The valve uses two electrical control coils to supply oil flow in opposite directions. The coils are operated by 24VDC outputs supplied at the I/O board. The oil is supplied under pressure by the hydraulic power unit and oil expelled from the collapsing cylinder end is returned through the counter balance valve to the tank. The electric valve operates by moving an internal spool that redirects oil flow. The spool operates in one of three positions: Right, left, and center. When a coil is activated, the spool is pushed to the right or left position, and oil flow is directed to the counter balance valve opening the return path from the actuator. Oil is supplied to one end of the actuator under pressure and the counter balance valve supplies a path for the opposite

side to return to tank. When no pressure is supplied to the counter balance valve, the return oil from the actuator has no path back to tank. With no path to return to tank, oil flow is blocked. With oil flow blocked, the rotary actuator is locked into position.

Failures internal to either valves or the actuator could allow oil flow while the control coils are inactive. Contech does not imply that the cutting mechanism is safe to work near while the system is inactive.

The cutting system requires two switch inputs and two DC outputs from the control system for operation. Two sensors are mounted on opposite ends of the rotary actuator indicating end-of-travel limits. The sensors feed inputs 1 and 2 on the I/O board. Two control-outputs (1 and 2) drive the electrical coils of the double-ended hydraulic valve. When a cut cycle is requested, the sensors are examined to determine which rotational direction is required. The appropriate coil is energized and oil flow is initiated. The coil remains energized until the opposite end-of-travel limit is tripped, or a time-out occurs. When a time-out occurs, a HELP2 will be shown on the top LED display and all other operations will cease. When the system is stopped by a safety failure, the blade will stop in a random position. After pressing the Reset button at the operator control panel, the system will attempt to "home" the cutter.

Diagnostics of cutting system control problems are simplified by observing the I/O status indicators and using the manual push buttons provided on the I/O board. As described in the I/O board section, manual push buttons are provided to force outputs and simulate inputs. Before applying power to the system, insure that the cut blade is free of restrictions. Engage the manual output operation with the slide switch located next to the ribbon cable on the I/O card (Red LED near the switch should be illuminated). If the guards are in place and the pump is active, manual push buttons OUT1 and OUT2 will control the cutters hydraulic valves. The IN1 and IN2 indicators will indicate the state of the end of travel sensors.

Limit Switch Adjustment

The limit switches are setup by forcing blade movement in one direction and then adjusting the switch. The switches are mounted on the side of the rotary actuator. To adjust, loosen the setscrew and reposition the switch. After adjusting switches operate the cutter in both directions and insure that the cutter blade returns to the top-dead-center position after rotating both directions.

Cutter Blade Removal

Sharpening or replacement of the cutter blade is necessary periodically depending on the type of material and hours of operation. Qualified personnel should only perform removal of the blades. Refer to Section 6.4 for cutter safety information.

⮜⮜⮜ CAUTION ⮞⮞⮞

Cutter Blades Are Very Sharp! Handle With Extreme Caution!

The following steps represent the typical blade removal procedure.

1. Insure that the cutter assembly is at top dead center.
2. Remove line voltage from the CompuSheeter System and lockout the safety disconnect switch.
3. If the CompuSheeter was purchased with a stacker or catch tray, the unit must be removed from the output side of the equipment.
4. Remove the front hinged cover and, the aluminum panels from inside the output cavity of the machine.
5. Measure the position of the Blade Tension Spring Adjustment Rod.
6. Loosen the Blade Tension Spring Adjustment Rod and unhook the spring from the Upper Blade Tension Arm.
7. Loosen and remove the bolts along the bottom of the lower blade.
8. Carefully remove the blade and set aside.
9. Leaving a bolt in each end of the blade, loosen and remove the bolts in the top blade.
10. Carefully remove the last two bolts and remove the blade.

Cutter Blade Installation

The cutter blade may be sharpened several times depending on any nicks and the amount of wear prior to service. Trained personnel must perform sharpening on special equipment only. If the blade is not within tolerance, it must be replaced. The replacement blade must be of the exact same specifications and should fit without modification.

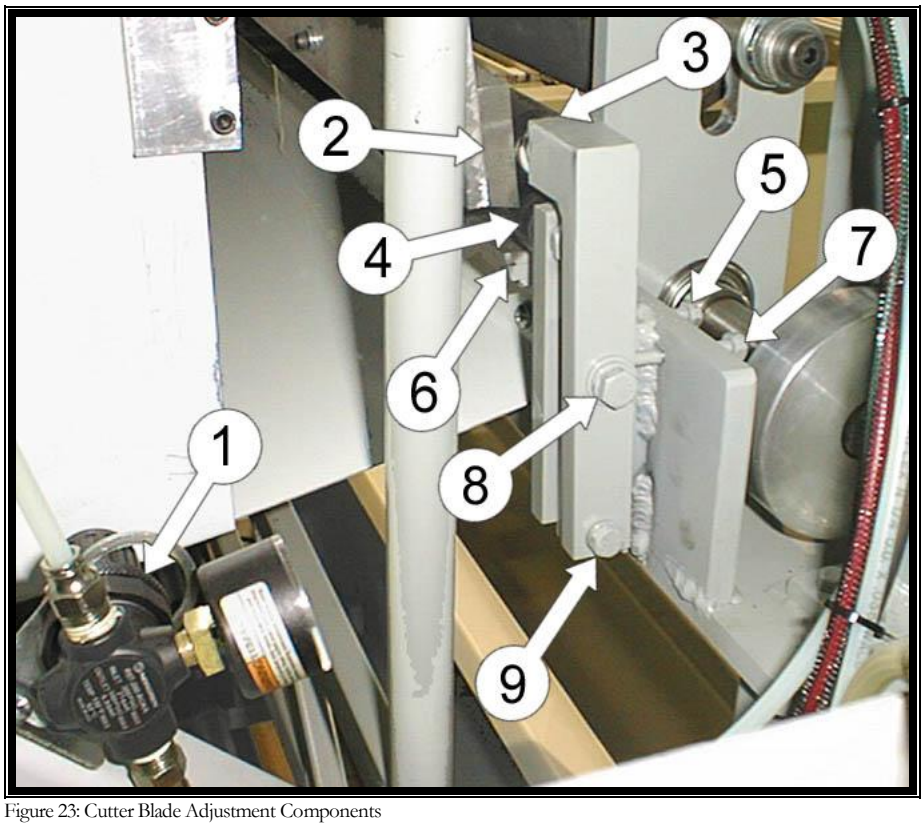

Figure 23: Cutter Blade Adjustment Components

Item	Description
1	Nip Roller Up Pressure Regulator
2	Upper Cutter Blade
3	Secondary Blade Mesh Arm & Follower Bearing
4	Primary Blade Mesh Arm & Follower Bearing
5	Primary Blade Mesh Adjustment Bolt
6	Lower Cutter Blade
7	Secondary Blade Mesh Adjustment Bolt
8	Secondary Blade Mesh Arm Attachment Bolt

Table 10: Cutter Blade Adjustment Components

Note:
The mounting patterns in the top and bottom blades are different and must be aligned correctly.

CAUTION
Cutter Blades Are Very Sharp! Handle With Extreme Caution!

The following steps represent a typical blade replacement.

1. Remove any burrs and debris from the mating surfaces of the blade and upper blade support assembly, the upper blade is identified by the number S018d032 stamped in the end of the replacement blade.
2. Carefully position the upper blade to the upper blade support assembly and start the two outer most bolts. Do not tighten at this time.
3. Start the remaining bolts into the blade assembly. Begin tightening the bolts from the center of the assembly out.
4. When the upper blade is securely in place, remove any burrs and debris from the mating surfaces of the blade and lower blade support. The lower blade is identified by the number S018d033 stamped in the end of the replacement blade.
5. Carefully position the lower blade to the lower blade support and start the two outer most bolts. Do not tighten at this time.
6. Start the remaining bolts into the blade assembly. Position the backside of the blade tightly against the roller support plate. Begin tightening the bolts from the center of the assembly out.

7. When both the upper and lower blades are secured in position. Loosen the 3/8"-16 bolt and the ¼"-20 locking nut on both of the blade mesh adjustment cam arms. Turn the screw clockwise one (1) turn to extend the cam, and create a larger gap between the blades; do not tighten at this time. Tighten the 3/8"-16 bolts and the ¼"-20 locking nuts.
8. Re-attach the spring to the upper blade tension arm and reposition the blade tension spring adjustment rod to the measurement taken before disassembly.
9. Replace the front hinged cover and, the aluminum panels.
10. Insure that the safety circuit is operational. Applying power to the system, pressing the reset push button to engage the hydraulic power unit and opening the front cover should generate a HELP5 code.
11. When all guards are in place and the safety circuit is operational, load the machine (See Figure 12) with a roll of material suitable for test cutting. Position the material to the extreme right (operator) side of the machine.
12. Using the manual controls, increment the nip rollers, feeding approximately 2" of material through the blade set.
13. The blades will require adjustment before the cut will span the entire width of the blades. Initiate the manual cut cycle; inspect the cut.
14. Loosen the 3/8"-16 bolt and the ¼"-20 locking nut on both of the blade mesh adjustment cam arms.
15. Turn the ¼"-20 screw on both of the blade mesh adjustment cam arms one-quarter (¼) turn counterclockwise.
16. Firmly press the Upper Blade Support Assembly back against the Blade Mesh Adjustment Cam Arms.
17. Tighten the 3/8"-16 bolts and the ¼"-20 locking nuts.
18. Repeat steps 13 through 17 as required to achieve a cut that spans the entire width of the blades.

Cutter Blade Bias Spring Adjustment

Adjustment or replacement of the Cutter Blade Bias Spring is necessary periodically depending on the type of material and hours of operation. Qualified personnel should only perform adjustment of the springs. Refer to Section 7.4 for cutter safety information.

Note:

Excessive Cutter Blade Bias Tension will shorten the life of the Cutter Blade.

The following represents the typical spring adjustment.

1. Remove either the Inner Cutter Cavity side panel or the Outer Access panel to gain access to the Cutter Blade Bias Springs.
2. Locate the Spring Tensioning Rods and loosen the jam nut on the top of the support arm tighten the lower nut approximately 1".
3. Begin by adjusting only the Operator side of the blade, if the cut problem remains, repeat steps one and two for the opposite side.

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Troubleshooting

The following troubleshooting section will help solve problems that may arise during the installation or operation of your system.

Symptom	Possible Problem	Corrective Action
No Power at Operator Control Panel.	No main power.	Check building fuses /breakers. Check CompuSheeter Safety Disconnect
Hydraulic Drive Motor won't start.	No main power.	Check Fuses and Circuit Breakers.
	The Safety Circuit is not active.	Check the safety devices and press the Reset pushbutton
Cutter Blade won't cycle.	No hydraulic pressure.	Check the Brake /Clutch pressure settings (35-psi Minimum).
	The Safety Circuit is not active.	Check the safety devices and press the Reset pushbutton
Safety Circuit won't reset.	One or more of the safety devices are not in the run position.	Check the safety devices and press the Reset pushbutton. For more information see Section 5.1.
No movement from Increment Nip set.	No Increment Nip set closed pressure.	Check incoming compressed air source.
	Failed or loose Roller drive coupling.	Tighten or replace.
Increment Nip set won't open.	Faulty control valve.	Replace Increment Nip set valve.
Inaccurate Sheet length.	Excessive nip roller pressure.	Reduce the Nip Down pressure (12 to 17 – psi). For more information see Section 5.3.

Table 11: Troubleshooting

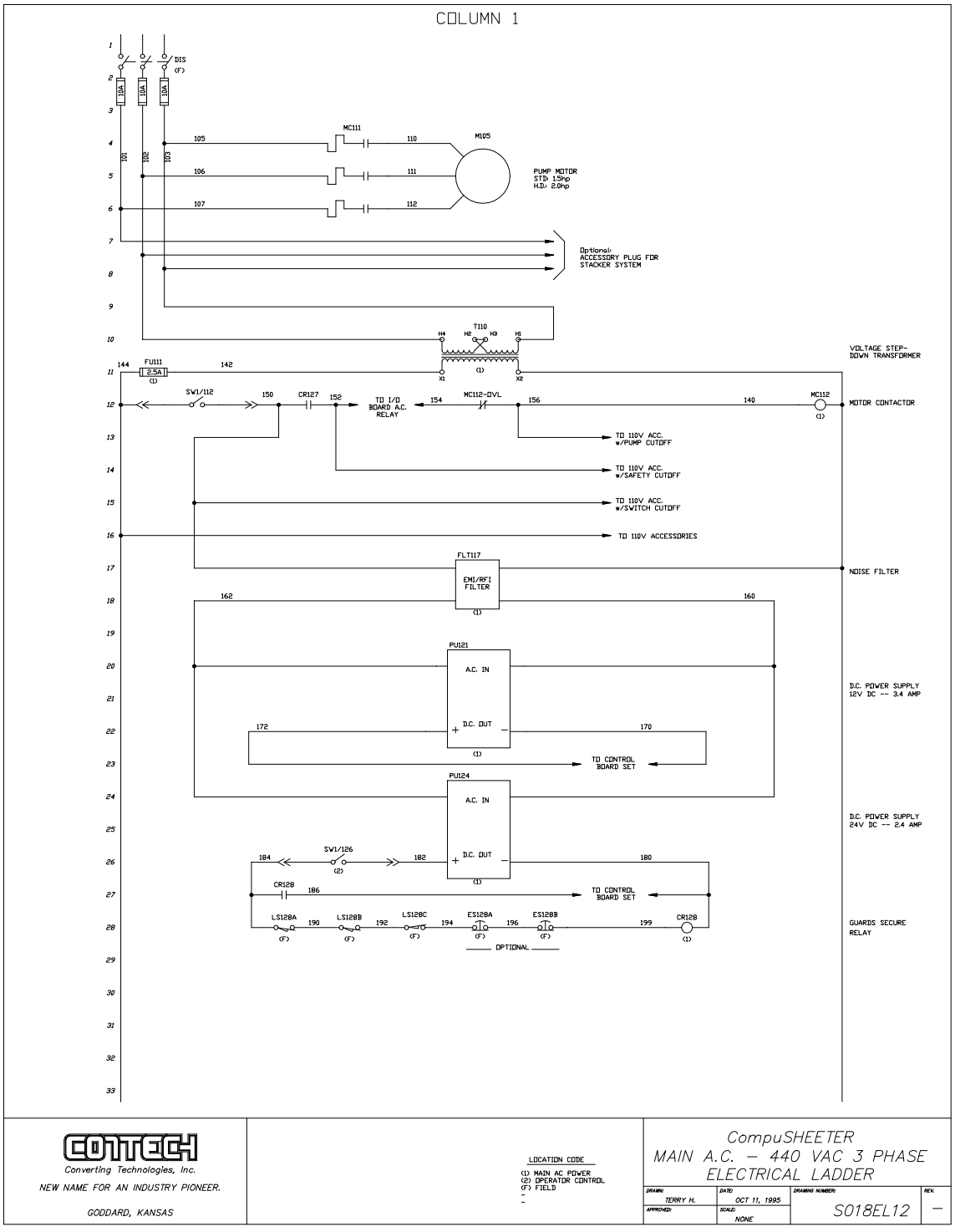
CompuSheeter Help Codes

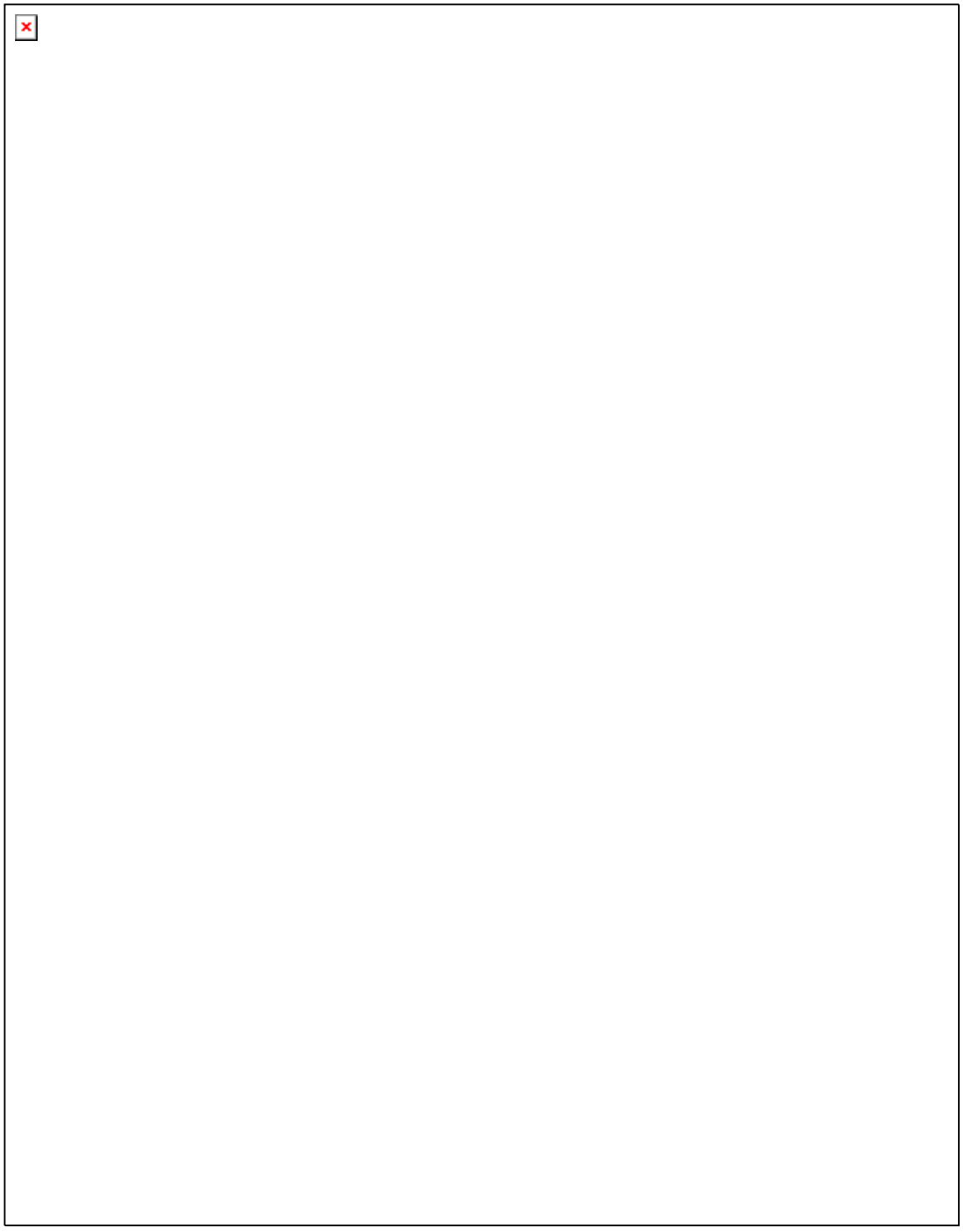
Help messages will be recognized when the word "HELP" followed by a number is displayed in the top window. Help messages are provided to alert the operator of a fault.

Code	Description of Error
HELP0	Invalid memory contents. Within the control system, certain parameters are stored while power to the system is off. The values stored include all of the setup parameters and calibration values. This error occurs when the values have changed during a power off situation. The contents of memory are maintained using a small battery mounted on the control board. The most probable cause of this error is the battery going low. Replace the battery and re-run calibration. This message is also displayed when calibration is being started since calibration re-creates many of the stored parameters.
HELP1	No Encoder Feedback. The CompuSheeter measures material by rolling a measuring wheel against the material as it is being moved through the pinch rollers. The encoder provides electrical pulses, representing distance, back to the control computer. When the roller has been commanded to move and the encoder pulses are absent, this error is generated.
HELP2	Cutter system failure. When the cutter is engaged, the cycle time is checked. If the cycle time is too long, Help2 is generated. A blade jam may have occurred physically causing the cutter to lock-up. Inspect the cutter for a jam and correct as necessary. Always observe safety requirements as defined in section 2. Other potential faults are limit switch adjustments and hydraulic system operation. These tests require a qualified service technician.
HELP3	Not used.
HELP4	Power failure. Occurs when either of the DC power supplies within the system drops too low. Check the power monitor circuits for proper operation. A qualified service technician must correct these faults.
HELP5	Guard open. The CompuSheeter provides a guarding system to help protect the operator from injury. When one of the safety guards are open, this error is generated. Close the guards and reset the system. This fault can also occur if the 24 VDC power supply drops too low. If the fault persists, check the power supply and its connections.
HELP6	Sequence Aborted. Occurs when the auto switch is pressed during a feeding operation.
HELP7	Need Calibration. The system must be calibrated before attempting to run material.
HELP8	Calibration Failure. Indicates that a failure has occurred during the calibration cycle. During this process, the values for each speed are recorded, starting at the slowest speed, to accommodate variations in individual systems. Any speed data recorded is invalid. If calibration is not successful, the operating pressure of the hydraulics should be checked.
HELP9	Speed or Rate values are invalid. The allowable range for the speed value is 1 to 11. The range for the Rate value is 1 to 10. Verify correct entries.

Table 12: Help Codes

Schematics


COLUMN 1
DIS
(F)
10A
MC111
105
110
M105
PUMP MOTOR
STD: 1.5hp
H.D.: 2.0hp
106
111
107
112
101
102
103
Optional:
ACCESSORY PLUG FOR
STACKER SYSTEM
T110
H4
H2
H3
H1
X1
X2
VOLTAGE STEP-
DOWN TRANSFORMER
144
FU111
2.5A
142
SW1/112
150
CR127
152
TO I/O
BOARD A.C.
RELAY
154
MC112-OVL
156
140
MC112
MOTOR CONTACTOR
TO 110V ACC.
w/PUMP CUTOFF
TO 110V ACC.
w/SAFETY CUTOFF
TO 110V ACC.
w/SWITCH CUTOFF
TO 110V ACCESSORIES
FLT117
EMI/RFI
FILTER
NOISE FILTER
162
160
PU121
A.C. IN
D.C. OUT
D.C. POWER SUPPLY
12V DC -- 3.4 AMP
172
170
TO CONTROL
BOARD SET
PU124
A.C. IN
D.C. OUT
D.C. POWER SUPPLY
24V DC -- 2.4 AMP
184
SW1/126
182
180
CR128
186
TO CONTROL
BOARD SET
LS128A
190
LS128B
192
LS128C
194
ES128A
196
ES128B
199
CR128
GUARDS SECURE
RELAY
OPTIONAL
LOCATION CODE
(1) MAIN AC POWER
(2) OPERATOR CONTROL
(F) FIELD
CONTECH
Converting Technologies, Inc.
NEW NAME FOR AN INDUSTRY PIONEER.
GODDARD, KANSAS
CompuSHEETER
MAIN A.C. – 440 VAC 3 PHASE
ELECTRICAL LADDER
DRAWN: TERRY H.
DATED: OCT 11, 1995
DRAWING NUMBER: S018EL12
REV: –
APPROVED:
SCALE: NONE



Glossary

AC	*Acronym. Alternating Current, an electrical current that reverses polarity at regular intervals.*
AC Motor	*An electric motor designed to operate using AC power.*
Actuator	*A device that converts force into movement, some examples of different actuator types are: air or hydraulic cylinder, lead or ball screw.*
Air Manifold	*A pressurized, tubular chamber with several outlets for conveniently supplying air to several pneumatic devices.*
Air Regulator	*An adjustable device used to maintain a preset air pressure.*
Air Shaft	*A unwind or rewind mandrel that expands when inflated.*
Ambient Condition	*The surrounding atmosphere and environment.*
Backlash	*Mechanical play, (slop/looseness) that exists or may develop through wear between a driven component and a drive source.*
Ball Bushing/Linear Bearing	*A tubular shaped ball bearing assembly designed for linear movement on a shaft.*
Ball Screw	*A mechanical assembly consisting of a threaded shaft and a ball bearing-type nut which, when the shaft is rotated, causes the nut to move linearly.*
Beverage Board	*A flat, dense card stock also called poster board.*
Bias (Blade)	*Typically, a cutter that uses a reciprocating blade positioned at a slight angle to the stationary blade.*
Cantilever	*A structure supported from only one end.*
Center Guiding	*The process of guiding a varying width web from an imaginary center line.*
CFM	*Acronym. Volume expressed in Cubic Feet Per Minute.*

Circuit Breaker	*A device used with electrical equipment to provide overload protection.*
Closed Loop	*A control concept in which feedback is used to modify the characteristics of the output.*
Clutch	*Typically, a pneumatically actuated mechanical coupling used to connect and disconnect a driving and driven part of a machine.*
Coalescing Filter	*Devices that collect and remove water and oil from air lines.*
Coefficient of Friction	*The relationship between the weight of a mass, and the force required to move it.*
Coil	*A number of turns of wire in spiral form, when energized creating an electromagnet. Typically used to magnetically change the position of an electrical, mechanical, pneumatic or, hydraulic device.*
Contacts	*The element of a relay or contactor which performs a junction of two electrical conductors.*
Converting	*The process of changing a web material into another material or product (e.g., plastic film into plastic bags).*
Coupling (Shaft)	*A mechanical device used to join a motor output shaft to a machine part, typically a roller.*
Cutting Plate	*A replaceable thin metal plate positioned on top of the lower platen.*
Cycle	*A series of events or operations that recur regularly and usually lead back to the start.*
Cylinder	*A piston-type actuator.*
Dancer	*A roller or arm positioned by the web that provides feedback to control web speed and /or tension.*
Dancer Linked Brake	*A braking system that uses dancer position feedback to adjust braking action.*
DC	*Acronym. Direct Current, an electrical current that flows in one direction only.*

DC Motor	*An electric motor designed to operate using DC power.*
DC Power Supply	*An electrical device used to convert incoming AC power to regulated DC power.*
Diaphragm	*A component made from a thin, flexible, durable material used in many automatic control devices to transfer force.*
Die (Tool)	*The cutting or shaping component used in a machine.*
Electrical Spike	*An unpredictable and infrequent momentary high electrical voltage which can harm electrical/electronic devices.*
Electromagnet	*A core of magnetic material surrounded by a coil of wire through which an electric current is passed to magnetize the core.*
Emergency Stop (E-Stop)	*An operator triggered device that will stop all motion in a system, typically requiring acknowledgment of the violation.*
Encoder	*A device typically electromechanical, that translates motion into electrical pulses. See also Resolver, Tachometer, or Transducer.*
Fan /Blower	*A device used for producing a current of air.*
Feedback	*The return to an input of a part of the output of a machine or control system, or process.*
FeedTable	*A reciprocating plate that can be extended from the press cavity to accept material sheets for processing.*
FPM	*Web speed expressed in feet per minute.*
Fuse	*Electrical overload protection device.*
Fuse Block	*A holder for a fuse or fuses including wire termination.*
Gain Control	*A controllable means to increase or decrease the frequency response.*

Gauge	*An instrument with a graduated scale or dial for measuring and indicating.*
Gear Reducer	*A mechanism used in power drive trains to modify the available torque or horsepower.*
Heated Platen	*A heated flat metal plate that exerts or receives pressure.*
HP	*Acronym. Available force expressed as horsepower.*
Hydraulics	*The branch of mechanics, which uses controlled hydraulic oil flow, and pressure to provide force to an actuator.*
Idler Roller	*A roller that is not driven, that relies on the material web for rotational force.*
Inertia	*A property of matter by which it stays at rest or in uniform motion in the same straight line unless acted on by an external force.*
Infrared Sensor	*An electronic sensor that uses infrared wavelengths to detect the position or presence of an object.*
Jog	*1 To align the edges of cut sheets of material.* *2 To manually move at a controlled slow rate.*
Jogger	*A machine that uses a vibrating table to align the edges of cut sheets of material.*
Laminate	*To bond layers of material using adhesive or other means.*
Lead Screw	*A mechanical assembly consisting of a threaded shaft and a nut which, when the shaft is rotated, causes the nut to move linearly.*
Limit Switch	*Typically, an electrical device that provides position information to a control system.*
Linear Actuator	*A mechanical actuator that uses an electric, pneumatic or hydraulic power to provide linear force. See Ball Screw.*
Low Voltage	*A voltage reading that is lower than the required or expected voltage.*

Make-ready	*The act of compensating for inconsistent cutting surfaces.*
Motor Drive	*An electrical device that provides voltage to drive an electrical motor (AC or DC).*
Motor Starter	*A relay capable of withstanding inductive load generated when starting an electric motor (AC or DC).*
Nip Roller Set	*A pair of parallel rollers, typically one driven and one idler with an adjustable opening.*
Open Loop	*A control concept in which feedback is not used to modify the characteristics of the output.*
Operator Interface	*Typically, a control or control panel provided for an operator to modify or monitor system variables.*
Oscillate	*To move back and forth between two points.*
Photo Sensor	*An electronic sensor that uses light wavelengths to detect the position or presence of an object.*
PID (Proportional, Integral, Derivative) Closed Loop	*A control concept in which error correction is calculated using the margin, and duration of the error.*
Platen	*A flat metal plate that exerts or receives pressure.*
PLC (Programmable Logic Controller)	*Acronym. A control computer that is designed specifically for machine control.*
PLI	*Acronym. Web tension expressed in **P**ounds per **L**inear **I**nch of web.*
Pneumatics	*The branch of mechanics which, uses controlled air-flow and pressure to provide force to an actuator.*
Point	*A unit of measure 1/72" (.072")*
Power Connector	*An electrical connection comprised of a plug and receptacle, capable of withstanding high current draw (AC or DC).*
Pressure Reducer	*Typically, a hydraulic component that senses secondary pressure to maintain that output pressure regardless of the incoming pressure.*

Pressure Relief	*Typically, a hydraulic component that uses a spring to hold an orifice closed until system pressure overcomes the spring and allows flow to the reservoir.*
Proportional Control	*An output that is directly related to an input.*
Proximity Sensor	*An electrical device capable of detecting the presence of an object.*
PSI	*Acronym. Available Force expressed in Pounds per Square Inch*
Pushbutton	*A small button or knob actuated by pushing, provided for operator control, electrical, pneumatic, or mechanical.*
Regulator	*Devices, which control or determine pressure, rate or time.*
Relay	*An electromechanical device for remote or automatic control that is actuated in variation of conditions of an electrical circuit and that operates other devices in an electrical circuit.*
Reset	*To restart or arm a control or safety system.*
Resolver	*A device typically electromechanical, that translates motion into electrical pulses. See also Encoder, Tachometer, or Transducer.*
Retrofit	*Replacing a portion of a system while, typically re-using part or all of the original components.*
Rod End	*An attachment device for the end of an actuator rod that can compensate for slight misalignment between the Actuator Base Mount and the reciprocating component mount.*
Roller Chain	*A series of metal links fitted together for the purpose of power transmission or support.*
Rotary Actuator	*A mechanical actuator that uses pneumatic or hydraulic pressure to drive pistons moving a rack gear linearly over a ring gear, delivering rotational force to single or dual output shaft (S).*
RF	*Acronym. Radio Frequency*

RPM	*Acronym. Rotational speed expressed as Revolutions pre Minute.*
RS232	*A serial communications protocol.*
Safety Chuck	*A mechanical device used to support an unwind mandrel, which when rotated automatically secures the mandrel.*
Selector Switch	*A small button or knob actuated by turning, provided for operator control, electrical, pneumatic, or mechanical.*
Serial Interface	*The act of sending information from one computer device to another one bit at a time.*
Service (Safety) Disconnect	*Typically, a large mechanical switch that is provided to completely remove incoming power for the purpose of storage or service of a machine.*
Sheave	*A pulley used with a V-Belt power transmission system.*
Shield (foil or braided)	*Typically, a metallic encasement surrounding wiring or components to avoid interference from RF signals.*
Slitter	*A cutting device that is positioned perpendicularly over or under the material web, while incremented through the system, the cutting device slices the web.*
Solenoid Valve	*Typically, a pneumatic or hydraulic valve actuated by an electromagnetic coil.*
Static Eliminator	*An electrical or mechanical device that is used to dissipate static electric charges from a web.*
Steel Rule Die	*Typically, a die made from extremely sharp metal rule bent into a shape and supported with wood.*
Stop Block (Screw Jack)	*The operator controlled mechanism used in conjunction with a spacer and position indicator, which limits the lower stopping position of the upper press platen.*
Stop Block (Spacer)	*An interchangeable round spacer used in conjunction with the stop block screw jack, which allows a press to accommodate different tooling heights.*

Tachometer	*A device used to measure RPM.*
Tool (Die)	*The cutting or shaping component used in a machine.*
Transducer	*A device typically electromechanical, that translates motion into electrical pulses. See also Encoder, Resolver, or Tachometer.*
Transformer	*An electrical device that employs the principle of mutual induction to convert variations of current in a primary circuit into variations of voltage and current in a secondary circuit.*
Trantorque	*An expandable insert typically, used to couple a roller to a shaft.*
Valve	*Any of numerous mechanical devices by which the flow of liquid, gas, or loose material in bulk may be started, stopped, or regulated by a moveable part that opens, shuts, or partially obstructs one or more ports or passageways.*
Variable Frequency Drive	*An AC motor drive device that is capable of varying the output frequency to alter the rate and torque of a drive motor.*
V-Belt	*A continuous "v" shaped tough flexible material for transmitting motion and power.*
Web	*The portion of a material roll that is threaded through a processing machine. The type of material, elasticity, maximum width, and processing speed are all factors from a processing stand point.*
Web Guide	*A control system that is dedicated to maintaining a lateral web position during processing of continuos or web fed materials.*
Web Processing	*The converting of material in continuos web /roll form.*
Web Tension	*The linear force that is measured in PLI, between two points on a material web.*

Warranty

Contech warrants to the original purchaser of this equipment, to replace or repair at the manufacturers choice. Any part, which in normal use proves to be defective in material or workmanship within a period of one (1) year or 2,080 hours of operation whichever comes first, when shipped prepaid to our factory in Goddard, Kansas. Contech does not warrant the paint or the stainless steel,

scratching or discoloration after installation due to normal usage. Labor will be provided at no additional expense if. The machinery is shipped freight prepaid to our factory, with the proper return authorization, or if the customer agrees to pay traveling and living expenses for a technician to work at their facility. Contech reserves the right to decide on the method of dealing with any claim under this warranty.

THIS WARRANTY WILL NOT BE IN EFFECT:

1. If any part has been altered or subject to misuse.
2. If the equipment has been improperly maintained as per instructions.
3. Unless part or parts were defective in material and workmanship under normal use and operated in accordance with factory operation instructions and servicing.

THIS WARRANTY IS LIMITED TO THE ORIGINAL PURCHASER

The above warranty is in lieu of all other warranties expressed or implied. Contech does not authorize any other person or representative to make or assume for it any other obligation or liability that is not in accordance with this warranty.

Warranty information is available by contacting Contech. No part or parts will be accepted for Contech replacement or repair unless a Customer Service Return Number (CS-#) has been issued. Contact Contech Customer Service Dept. with model and serial number and nature of problem or defect at 1-316-722-6907.

This warranty gives you specific legal rights and you may have other rights which, vary from state to state.

Note:

Contech does not consider small hydraulic line leaks covered by warranty. The equipment was tested for 10 to 12 hours under full load for operation and leaks. After shipment, start up and high-pressure operation for 30 days re-tighten all hydraulic fittings. If you have any questions, call our customer service department.

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