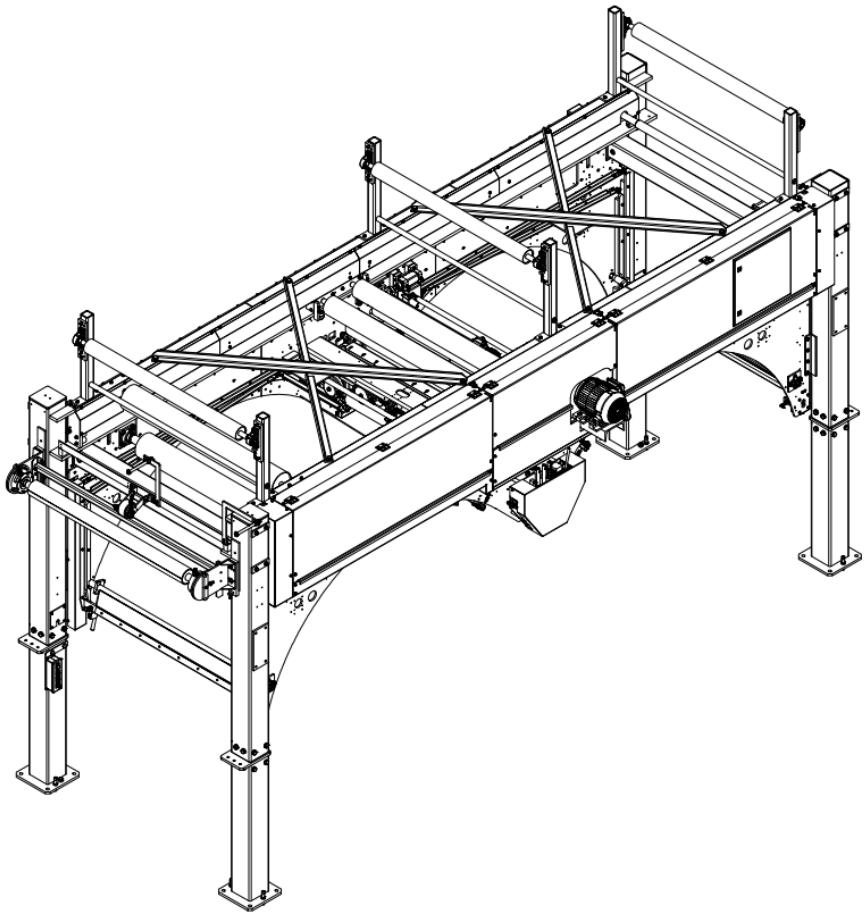
Paper Splicer

Maintenance Manual



Gyptech

Proven Technology Worldwide

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Introduction

This manual contains **Original Instructions** written to provide detailed technical information to assist in the maintenance of the Paper Splicer. For information regarding normal operation please refer to the Area Operator's Manual. Maintenance should only be performed by qualified, trained personnel.

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1 Safety Overview

Never put yourself at risk.

Many pieces of equipment have the potential to cause serious injury or even death. Be sure to understand the safety concerns related to a piece of equipment before undertaking or performing any maintenance or clean out procedure. Work with your supervisors to address any safety concerns prior to undertaking work.

1.1 Splicer Disconnects

Both splicers share a local disconnect at the isolation console and a secondary panel disconnect on the paper handling area drive panel. A manual lockable air dump valve is located on the isolation console.

Note: The local disconnects will cut the high voltage power to the splicers. They do not disconnect the power to the PLC. However, the output module that feeds the splicer solenoids is de-energized. The local disconnects will not exhaust all air from the system in a safe manner. The manual air dump valve must be locked out as well to deem the equipment safe. This manual dump valve is typically located on the isolation console provided. The splicers have an auxiliary air pressure tank and care must be taken to ensure no pressure remains. Use the **test mode** HMI screen to attempt to move the nip heads to check for remaining air in the system before entering the machine.

1.2 Safe Entry to the Splicer

DANGER: Avoid entering the Splicer with air supplied to the machine. The dancer can move very rapidly if energized and can cause serious injury to anyone in its path. When threading paper through the splicer unit (web up operation), shut off and lock out the manual dump valve on the air isolation station before anyone enters the splicer.

Note: Some operational check functions are performed with power and air supplied to the machine. In this condition, it is recommended that the dancer be in the full storage position. In this position, the only direction that the dancer can move is towards the mixer, which occurs at a slower speed and reduced air pressure. This is **NOT** a substitute for other safety measures.

Zone air must be dumped for any maintenance purposes. As a further safeguard, always confirm that the splicer air is not operational by attempting to move the nip heads using the **test mode** HMI screen.

1.3 Pinch Points

The web bar is capable of initiating movement automatically. Due to the close proximity of the web bar to operator work areas, not all pinch points can be fully guarded. Operators should be careful to keep hands away from the web bar, chains and sprockets while the web bar is moving.

At no time should any personnel climb on the active equipment and reach into the splice head. Only after following proper lockout procedures can the splice head be deemed safe. Both the pressing force of the nip assemblies and the cutting knives can lead to serious injury. **Note:** Even after properly locking out the machine, care must be taken when working within the splice head due to the sharp edges of the knife.

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During normal operation as well as standby, the dancer can move quickly and with force in either direction. At no time should any personnel put their bodies or limbs in the general area of the dancer. Only after following proper lockout procedures should operators reach around the dancer to thread paper.

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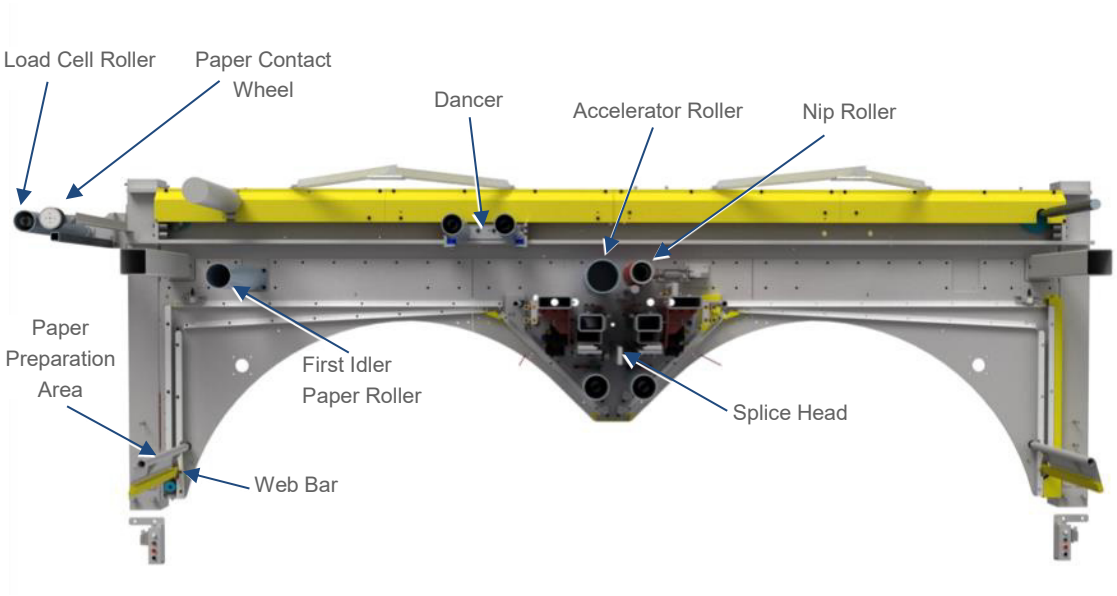
2 Equipment Overview

2.1 Major Components

A typical high speed paper handling system contains two independently operating splicer units. One unit supplies the bottom (face) paper and the other unit supplies the top (back) paper. There are three major functions of a splicer unit: web preparation, splicing and paper storage. The splicer also maintains paper tension in conjunction with the roll stand.

An encoder mounted on the first idler paper roller is used in conjunction with the roll stand pulse sensor to calculate roll diameter.

The paper contact wheel is used to detect forward or reverse motion of the paper. This is mainly used to detect a paper break, and is also used to detect paper being manually pulled forward during threading.



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2.1.1 Web Preparation Equipment

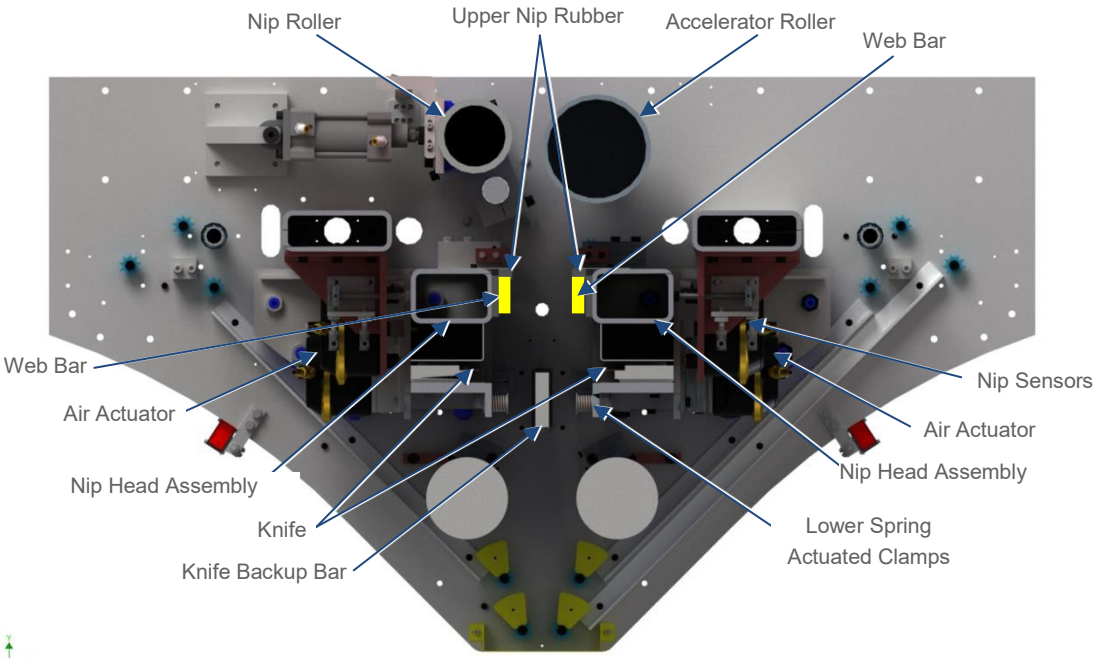
Web preparation equipment consists of a left and right web bar and draw bar (prep plate). The web bar and the draw bar are used to prepare the splice on the new paper and also position it in the splice head.

The web bar carries the prepared splice into, or if necessary out of, the splice head. While preparing the splice, the web bar functions as a flat working surface, and incorporates a built-in knife slot for cutting the paper straight. Each bar can be manually controlled by the corresponding web bar pushbutton pendant located at the side of the splicer unit. The web bar is powered by an electric servo motor which drives a chain system to move the bar in and out of the splice head. The servo motor enables position control of the web bars. The web bar home sensor is used to define the initial position of the web bar.

The main function of the draw bar is to create a paper orientation that is easy for splice preparation. A secondary (optional) function of the draw bar is to provide a larger surface area to work on when applying double-sided tape to the paper. To ensure the draw bar is clear of the web bar path, and to prevent the web bar moving during splice preparation, there is a sensor included to indicate the draw bar is returned properly.

2.1.2 Splice Head Assembly

The splice head assembly is where splicing and cutting occurs during a splice sequence. The basic components of the splice head assembly are noted on the following diagram:



The nip assemblies are responsible for generating the forces required to press the joint together during a splice. They move in/out via pairs of air actuators; air pressure forward (in) and spring return (out). Initially they are moved in with a lower pressure and then the air pressure switches to line pressure for maximum force. The nip assemblies have a strip of rubber at the top where the web bar sits, and a series of spring actuated discs located in line with the knife backup bar. During a splice sequence, the web bars at the top

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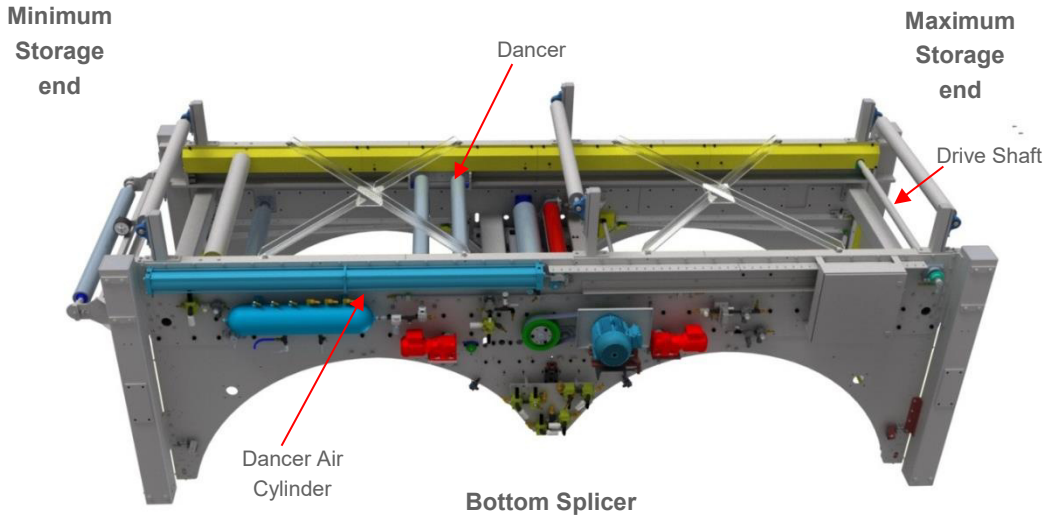
are pressed together creating the splice joint and the discs at the bottom hold the paper tight. On the old paper side, the knife is pushed forward using another pair of air actuators to cut the old web of paper. Once the nip assemblies open up, the new splice joint is pulled up through the pressing force of the nip roller against the accelerator roller. The nip roller further adheres the joint while also providing additional grip for the accelerator roller. The accelerator roller speeds the paper up to line speed to reduce the splice time required.

There are two sensors on each nip assembly. They are used to monitor if the nip assemblies are in or out (forward or back). The nip roller also has a sensor that is used to flag if the roller is pushed back during a splice by paper or tape wrapping itself around the accelerator roller. Pressure of the nip roller can be adjusted as well as the low pressure setting on the nip assemblies.

2.1.3 Dancer System

One function of the dancer system is to provide paper storage. The stored paper then allows for the unit to perform splices at zero web speed and still feed the line with paper at a constant speed. Another function of the dancer is to generate and maintain paper tension in conjunction with the brakes on the roll stand.



The paper storage is attained through a series of stationary rollers and a moving dancer with two rollers. When the dancer is fully back (away from mixer), the maximum amount of paper storage in the system is achieved.

The dancer is powered with an air cylinder which is coupled to a drive shaft via a chain and sprocket arrangement. The air cylinder provides enough pressure to induce the desired tension to the paper. During normal operation, the dancer pulls the paper back. The air pressure in the cylinder is controlled by the program via the I to P transducer. Increasing the paper tension on the operator console results in an increase in air pressure on the dancer cylinder. When the splicer is put into WEB UP mode, the air is switched to the other side of the cylinder and drives the dancer forward. The speed and pressure of the air entering the cylinder can be adjusted.

An encoder is coupled to the dancer drive shaft and is used to detect the dancer position and speed of movement. As part of the tension control system, a braking signal is generated proportional to the speed of

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the dancer movement and the position of the dancer in order to maintain the tension set point. There is also one sensor that acts as a calibration check on the dancer encoder every time the dancer passes by.

2.2 Technical Data

2.2.1 Pneumatic Pressures

When checking or resetting pneumatic regulators, reference the schematic air diagram (SD) drawing of the machine.

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3 Maintenance Procedures

3.1 Lockout Procedures

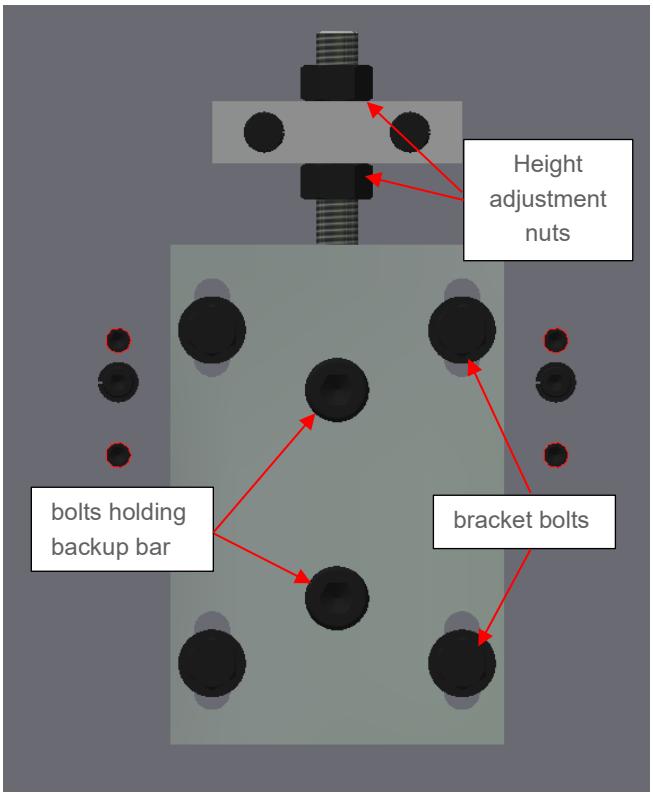
As equipment may start automatically, always lock out any source of motive power (electric, hydraulic, steam, compressed air, etc.) before performing maintenance or cleaning functions. Note that potential energy may also be stored in some equipment such as those held in a raised position by hydraulic or air pressure and that such equipment may move or fall suddenly if pressure is removed.

Depending on the equipment layout, electrical lockout may be performed at the electrical panel or locally with a safety switch or disconnect. Air pressure is removed and locked out at the manual dump valve. As a further safeguard, you must confirm that any equipment in the system being worked on is not operational after being locked out. Test for this by using the normal means of starting, i.e. the operator controls on the HMI station or the manual HOA switch.

The above procedure is a general recommendation. Operating and maintenance staff must follow lockout procedures and operate in compliance with their company policy and local regulations.

3.2 Backup Bar Setup

The backup bar needs to be adjusted or removed in a few situations. Follow the below procedure to optimally position the bar in relation to the knife:



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1. Check that the four bolts (two per side) holding the backup bar are properly torqued. Do not omit knurled washers when assembling.

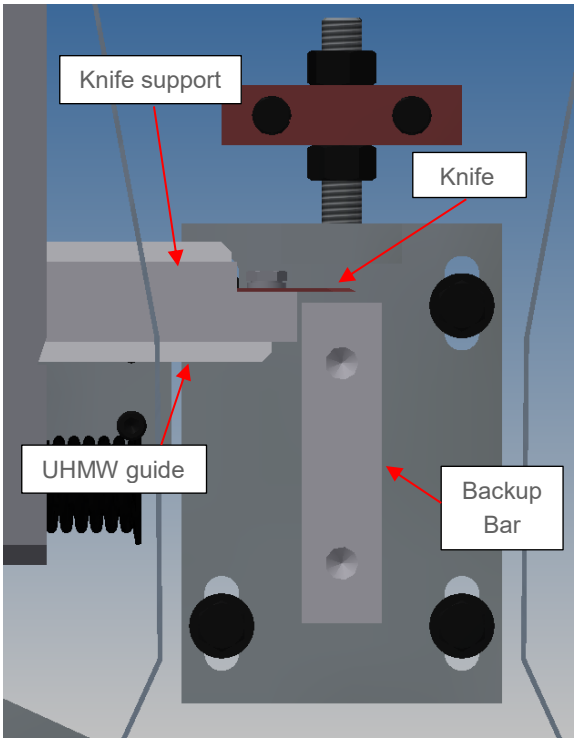
2. Loosen the height adjustment nuts to move the bar down to the lowest position.

3. Energize machine.

4. On the HMI, go to TEST MODE and actuate one knife at a time. Using a tape measure, measure the distance of the bottom edge of the backup bar to the bottom of either the knife support. Take care not to measure to the UHMW guides.

   Danger: Do not reach into splice head! Machine is live and can cause serious injury or death. Only move tape measure into splice head.

   Caution: Do not actuate nip head while backup bar is loose as the bar could take damage.



5. Use nuts to adjust backup bar up until the knife clears the top of the backup bar by 1/8. Ensure dimension is even side to side.

   Caution: Approach this dimension conservatively. If the backup bar is set too high, the knife will be damaged when actuated.

6. Tighten adjustment nuts and all bracket bolts and confirm position.

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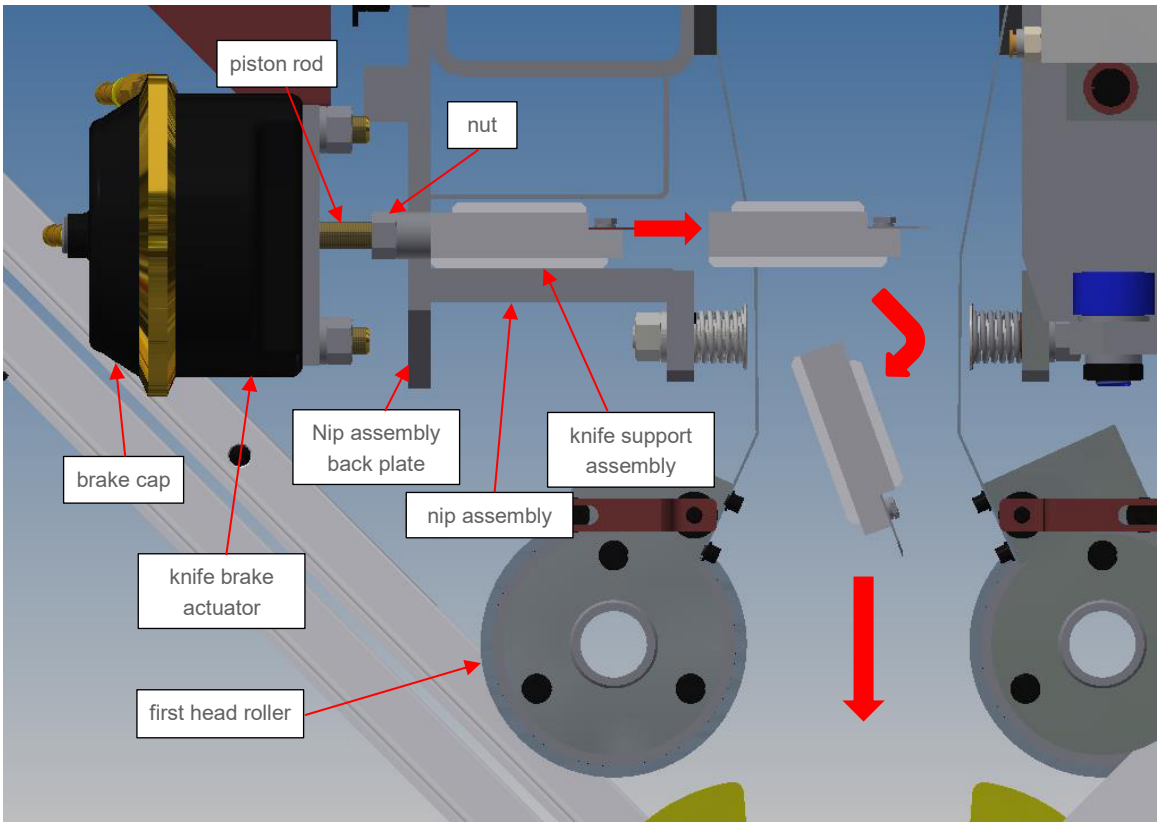
3.3 Replacing the Knife Support Assemblies

The knife support assemblies consist of an aluminum bar and UHMW guides. These items need to be replaced when showing significant wear or damage, usually indicated by vertical knife movement.



Caution: Ensure machine is locked out at all times during this procedure. Moving elements in the splice head can cause serious injury or death.

1. Remove backup bar.
2. Disconnect the air hose from the knife brake actuators and remove the cap from the brake housing.
3. Loosen the nut on the piston rod and unscrew piston from knife support assembly.
4. Cover the knife with cardboard or Styrofoam to prevent injury. Remove knife support assembly (approximately 30lbs (14kg)), pulling it towards the center of the machine and down between the two first head rollers.
5. Bring the new knife support assembly into the splice head from between the two first head rollers and place it on the nip assembly.
6. Connect the piston rod to the back of the knife support and thread in until the knife support touches the nip assembly back plate.

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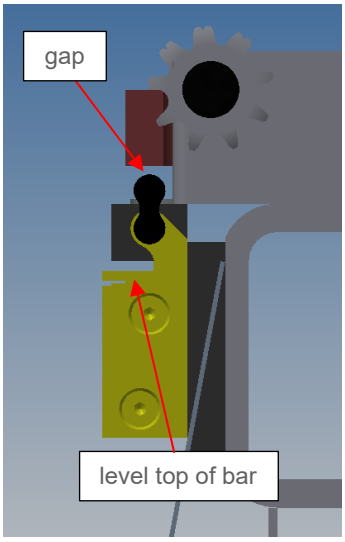
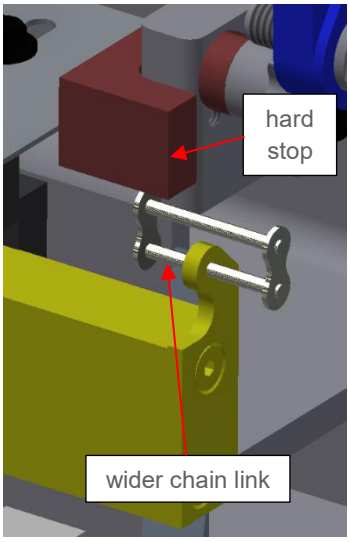
7. Tighten up the nut, attach the brake housing cap and connect the air hose.

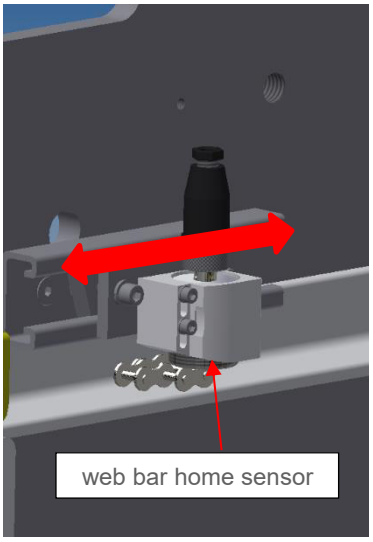
8. Install and setup the backup bar (see 3.2).

3.4 Web Bar Setup

For successful splices, the correct setup of the web bar is critical. While pre-set on installation, it can get misaligned during normal operation and needs to be adjusted occasionally.







1. Move both web bars into the splice head. Visually inspect if the top of the web bar is level, and if the web bars are even with each other.

2. Move the web bar out of the splice head, stopping it while it is in the vertical portion of its travel near the prep plate.

3. If leveling is required, loosen the coupling on the web bar drive shaft and rotate the chain on one side of the web bar until the bar is level. Leveling the bar will change the gap between wider chain links and hard stops, keep this in mind when moving the web bars into the head later on.

4. Identify the WEB BAR HOME sensor using the EL drawing and device list. Shift the sensor away from the splice head to ensure the web bar will stop before bottoming out in the prep plate area.

5. Move the web bar out until it is approximately 3mm (1/8”) from the end of its travel (the web bar should be too low for the prep plate to be engaged in this position).

6. Move the WEB BAR HOME sensor so that the double wide chain link will just begin to trigger it in this position.

7. Home the web bar from the HMI screen.

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8. Move the web bar into the head. Measure the distance between the wider chain link and the hard stop, it should be approximately 1/8” (3mm).

   Caution: Approach this dimension conservatively. Driving the web bar into the hard stops can damage the wider chain links.

9. With both web bars in the head, make sure the tops of both web bars are even.

10. If the dimensions found in steps 8-9 are not correct, offsets need to be applied to the web bar in head position set points. This can be done from the HMI screen.

3.5 Replacing Dancer Cam Followers

The Cam followers guide the dancer along its track and keep it from shifting side to side. At the same time, setting them too tight against the rail will increase the force required to move the dancer, which will negatively affect tension control.

1. Replace worn Cam Followers.

2. Move the dancer to 90% full storage position.

3. Adjust the eccentric axis of the Cam followers to adjust their distance to the track. Set one Cam follower to touch the inside of the track lightly. The remaining three Cam followers should turn freely, with minimal distance to the track.

4. Manually move the dancer along the full length of the track. Ensure that at all times only one Cam follower touches the inside of the rail.

5. Stop the dancer in front of the DANCER RESET sensor. Attempt shifting the dancer from motor side to operator side and confirm that the sensor is made at all times, and does not contact the flag. If the play in dancer position is larger than the sensing distance, readjust the Cam followers and repeat steps 2 – 5.

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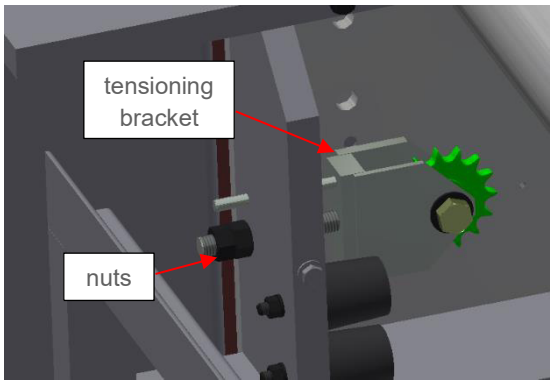
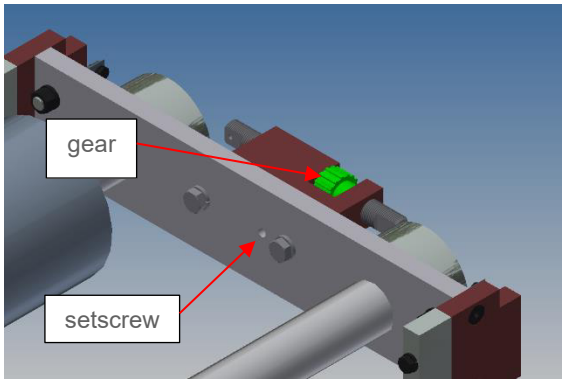
3.6 Replacing and Tensioning the Dancer Drive Chains

The tension of the dancer chains as well as the proper alignment of the dancer are two important factors influencing machine performance. Follow the procedure below when replacing your chains due to regular wear.





1. Remove the old chain and confirm the exact number of chain links.
2. Place the new chain on the sprockets and connect it to the dancer.
3. Move the dancer up against the bumpers on the full storage end of the machine.
4. Use the nuts on the tensioner bracket to increase chain tension until the chain touches the track for a length of 6’ (1830mm).
5. With the dancer at its usual running position (~90% full storage), measure if the dancer is square to the first idler paper roller. About 3” (75mm) from the left end of the roller face, loop a tape measure around both rollers. Repeat on the other end of the roller and compare.
6. The rollers are sufficiently square to each other if the left and right hand dimension are equal to within less than 1/32”. To adjust the alignment, turn the gear located on the operator side of the dancer. The gear can be locked in its final position with the setscrew (1/8” / 3mm socket head) accessible through the dancer side plate.

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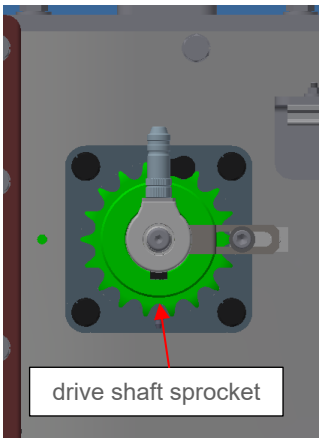
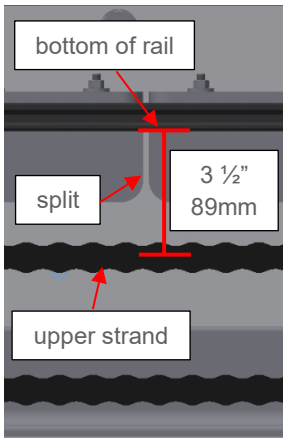
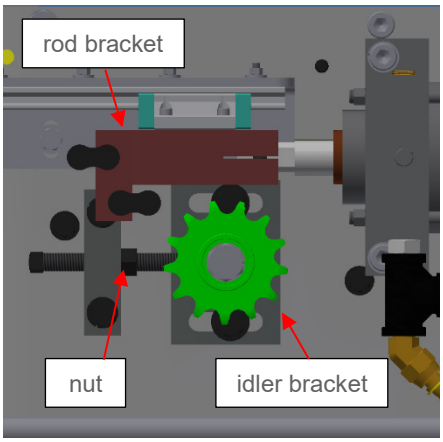
3.7 Replacing and Tensioning the Dancer Cylinder Chain

Similar to the dancer drive chains, maintaining the correct tension on the dancer cylinder chain has a significant influence on machine performance. Replacing and tensioning the chain is best done following the procedure below.







1. Move the dancer against the rubber bumpers on the full storage end of the machine, retracting the cylinder completely.

2. Remove the old chain and confirm the exact number of chain links.

3. Place the new chain on the sprockets and connect both ends to the rod bracket.

4. Use the nut on the tensioning bracket to adjust the slack in the chain. Measure the slack at the split in the linear rail support. Tension the chain until the center of the upper strand is located 3 ½" (89mm) from the bottom of the linear rail.

   Note: Do not lengthen or shorten the chain! If the chain is too tight or to lose to achieve slack as indicated, shift the chain a tooth on the drive shaft sprocket and tension again. Ensure that the dancer remains pushed against the rubber bumpers during the adjustment.

5. Tighten idler bracket bolts and jacking nut.

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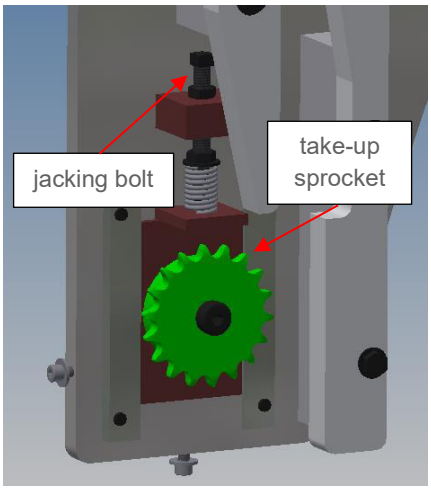
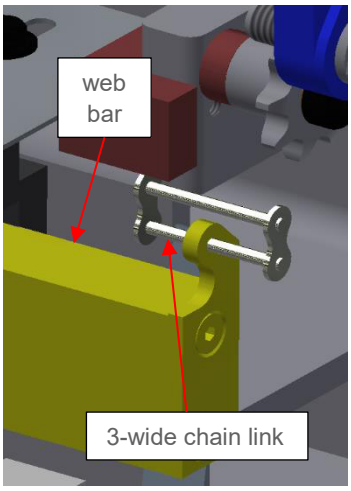
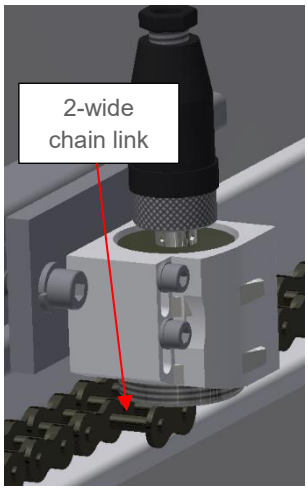
3.8 Replacing and Tensioning the Web Bar Chains

The steps below provide instructions to make replacing and tensioning the web bar chains quick and easy.

Note: Operator-side and motor-side chains are not identical! The positioning of the 2-wide and 3-wide chain links is essential for correct functionality.







1. Move the web bar out of the splice head.
2. Remove all guards covering the web bar chain take-up sprocket.
3. It is recommended to mark the position of the two wider chain links of each chain before removing the chain to avoid confusion at assembly.
4. Remove the web bar by sliding it off the 3-wide chain link.
5. Loosen chain tension at the take-up sprocket using the jacking bolt and remove the chain.
6. Count the exact number of chain links between wider links and the total number of chain links. Copy the setup when assembling the new chain.

   Note: Incorrect chain setup will keep equipment from operating correctly and can cause damage to the equipment.
7. Place chain on sprockets, using previously marked positions as a guide.

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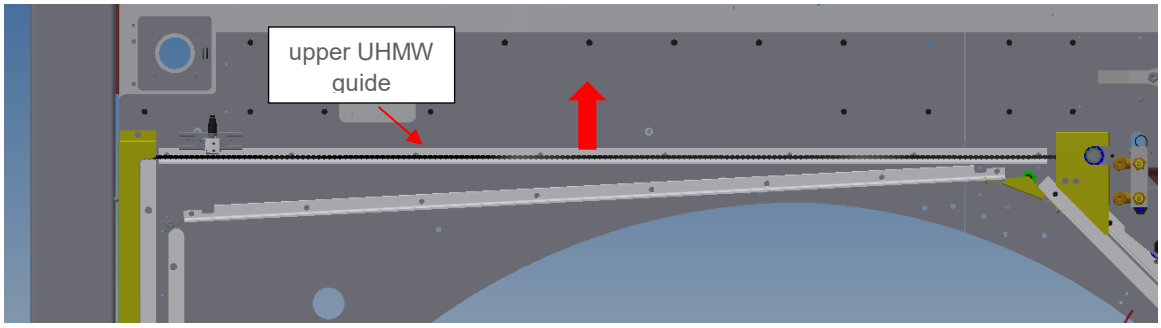

8. Find the centre of the upper UHMW guide. Utilize the chain take-up to adjust the tension until it requires ~5 lb-force (2.25 kg, 22N) to lift the chain up by 2 1/4" (57mm). Measure force required using a fish-scale.

9. Connect web bar and follow section 3.4 **Fehler! Verweisquelle konnte nicht gefunden werden.** to achieve exact positioning and verify sensor timing.

   Note: When running the web bar for the first time, carefully observe for any interference of the web bar or wider chain links with guards or splice head elements.

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4 Maintenance Schedule

The following table summarizes the optimal maintenance intervals.

4.1 Daily Tasks

Task	Notes
Visually inspect machine for tape buildup and debris that will affect equipment performance.	Remove buildup only when safe to do so. Lockout required in many instances.

4.2 Weekly Tasks

Task	Notes
Clean all accumulated dust and debris from the machine.	Remove dust and debris only when safe to do so. Lockout required in many instances.
Clean any accumulated tape from all paper rollers.	Remove tape only when safe to do so. Lockout required in many instances.
Clean all photo sensors.	Do not use harsh chemicals that could damage the sensors. Glasses lens cleaner recommended.
Verify web bar has not skewed.	Web bar should be parallel with top of splice head nip assembly. Adjust using the coupling on the drive shaft.
Inspect the dancer cylinder I to P transducer.	Verify signal sent to unit matches actual air pressure output. Replace/clean/repair unit if it sounds abnormal.

4.3 Monthly Tasks

Task	Notes
Drain air filters.	This equipment requires clean, dry air. If filters are excessively dirt or lots of condensate is present, equipment performance may be affected.

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Check condition of web bar (straightness).	Repair or straighten if condition could lead to performance issues. Replace if repair is not possible.
Inspect the rubber on the nip assemblies in the splice head.	Replace if there is excessive wear or missing pieces.
Check the unit for air leaks.	Repair any leaks before returning the equipment to operation.
Check dancer chain tensions and adjust if necessary.	See sections 3.6 and 3.7 for chain setup. Over tensioning can result in poor paper tension control.
Check the condition of the web bar deflector springs.	Straighten/replace if necessary.

4.4 Semi-annual Tasks

Task	Notes
Check accelerator motor drive belt tension.	Replace belt if the proper tension cannot be set.
Lubricate the web bar drive shaft bearings.	Follow bearing manufacturer guidelines.
Check the pressure settings on all the air regulators.	Re-adjust settings to original values (see air schematic drawing)
Lubricate accelerator roller bearings.	Follow bearing manufacturer guidelines.
Check the knife backup bar condition as well as the mounting bolts.	Replace if bar is deformed or excessively marked. Verify bolts are tight (note, they are threaded into aluminum).

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Inspect condition of web bar chains and sprockets.	Clean and lubricate chains if required. Check chain tension.
Check condition of rubber on the nip roller.	Remove any buildup and ensure pressure is even along whole roller face. Replace if rubber is damaged and leading to uneven contact.
Verify load cells are reading as expected.	Refer to vendor manual for procedure.

4.5 Annual Tasks

Task	Notes
Lubricate the dancer drive shaft bearings.	Follow bearing manufacturer guidelines.
Check the dancer rollers for squareness (see 3.6)	Adjust the gear on the dancer to set the dancer rollers parallel to the accelerator motor. Ensure that the set screw keeps the gear from rotating.
Check all the splice head pneumatics for proper function, leaks and internal rust.	
Check all bolts on moving parts for tightness.	Torque as per grade and size.
Check the condition of the knife blades.	Replace if teeth bent or broken.
Inspect the condition of the air actuators on the splice head (actuators for nip assemblies and knives).	Replace if showing signs of excessive wear or impending failure.
Check the paper break wheel rubber coating and replace if excessively worn or showing flat spots.	
Replace any paper roller bearings if there is excessive noise/vibration/play.	

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5 Troubleshooting

Due to the intricate nature of the splicing process, this section will outline only basic mechanical approaches to problem solving. Should the maintenance steps outlined below fail to fix the issues, we recommend contacting a Gyptech representative.

5.1 General

Problem	Possible Cause(s)	Possible Solutions
Splice not ready	Both web bars not fully in head	Use selector switch to move web bar into head.
	Web Bar in position can't be reached	Home the web bars. Check the web bar motor drives for faults. Ensure nothing is mechanically preventing web bars from reaching the in head position.
	Nip forward sensor not made	Check the setup of the nip forward sensors. Using test mode, ensure they are on when each head is forward individually at low pressure, both heads are forward at low pressure, and both heads are forward at high pressure.
Splice sequence doesn't trigger	Auto Splice not enabled	Enable auto splice.
	Too large a diameter being calculated, causing the roll to run out before reaching auto-splice setpoint	Check that the roll stand spindle pulse sensor and the first wrap roller encoder are functioning correctly. Check that the core is not slipping around the chuck.
Splice coming apart	Splice tape protective layer not removed.	Ensure protective layer has been removed from double-sided tape.
	Nip roller not touching accelerator roller evenly.	Clean both rollers of all buildup. Ensure that nip roll cylinders extend completely and nip roller is not missing parts of its rubber coating.
	Buildup on nip heads or knife backup bar. Possibly rubber missing.	Free all splice head components and the nip roller from debris and tape buildup. Replace rubber if worn or damaged.

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	Nip heads jamming or not moving evenly.	Check nip actuator and cam follower functionality. If working correctly, check nip hard stop setup. If hard stops set uneven, nip assembly tends to jam when moving.
	Prepared splice too soon and paper fuzz or glass fiber affected splice tape.	Do not remove protective layer from splice tape too early. Do not move the web bar into the splice head too early.
	Web Bar(s) not moving to correct positions	Home the web bars. Check that web bars are even in the head. If problem persists, check web bar home sensor setup (see section 3.4).
	Web Bar(s) are no longer straight or have been modified	Correct Web Bar(s) straightness so that Splice Head properly presses the joint together during a splice sequence
No or low quality cut	Knife not actuating or not actuating evenly.	Check if the air actuators extend and retract evenly and quickly. Observe for air leaks and ensure valves are working correctly.
	Knife damaged / worn.	Check the knife for missing or worn teeth and replace if not performing sufficiently. Also check if UHMW guides on knife support are worn and replace to limit vertical play.
	Backup bar damaged or not setup correctly.	Clean backup bar and check for damage. Setup backup bar to ~1/8” below the lower of the two knifes evenly across whole length.
Paper vibration, tracking, wrinkling in Splicer	Lower than usual paper quality.	Low paper quality is the most common reason for wrinkling in the splicer. Rule out paper quality issues before examining mechanical components.
	Buildup on rollers.	Clean all rollers from any buildup. A tight runout is imperative for good splicer performance. Bad runout can lead to vibration on the paper as well as tracking issues.
	Rollers out of alignment.	Rollers need to be level and square to the paper path. Square rollers in relation to accelerator roller to within 1/16” end-to-end. Level rollers to within 0.010”.
Tension spikes or drops / unstable dancer	I to P transducer not working as required.	Check for air leaks. Investigate if the I-to-P transducer display value matches its input and output. Replace if faulty.

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	Dancer encoder not reading as required.	The encoder on the dancer chain drive shaft can be loose on the shaft. Additionally, the encoder counter card can be faulty.
	Dancer reset sensor not working right.	The dancer cam followers might be set with too much lateral play for the dancer. The sensor does not pick up the sensor flag. Check sensor for correct operations, restrict lateral movement or readjust sensor.
	Dancer cylinder leaking or worn.	Ensure the dancer cylinder fittings and seals do not leak. Record and compare the minimum pressure it takes to move the cylinder rod (detached from dancer) on both splicers. A worn cylinder increases pressure required.
	Roll Stand brakes not performing as required.	See Roll Stand Maintenance Manual.
	Roll diameter not calculating properly	Check that the roll stand spindle pulse sensor and the first wrap roller encoder are functioning correctly.
Web bar not moving	Web bar safety sensor beam blocked	Ensure nothing other than the web bar is blocking the beam of the safety sensors. Clean dust off of the sensors.
	Web bar safety sensors out of alignment	Ensure the send and receive sensors have not been bumped out of alignment with each other.
	Web bar motors are faulted	Check if the web bar motors are displaying a fault on the display and reset the motors if required.
	Web bar motors require homing	Perform a home function on the web bar.
	Enable pushbutton not pressed.	The enable button and the web bar in switch must be pressed at the same time to move the web bar while it is near the splice preparation area.
	Enable pushbutton not responding.	Check the wiring on the faulty button and/or replace the button as required.

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Web bar getting stuck in splice head	Spring steel guide setup incorrect.	The spring steel guides in the splice head are guiding the web bar past all splice head elements. Stop web bar in front of backup bar and adjust spring steel guides to have 3/16” space between web bar and nip bolts.
	Nip bolts damaged.	The nip bolts can be damaged or cracked over time and protrude out into the travel space of the web bar. Replace if broken.
	Web bar resistance too high.	The web bar motor torque safety settings can’t overcome too much resistance. The web bar chain tension might be too high. Also check sprockets for increased resistance.
Line suddenly shutting down / not starting up	Motion Sensor wheel not functioning correctly	Check the motion sensor wheel for proper functionality. Sensors could have come loose or the wheel could be shifting out of the sensing range of the sensors.
Auto-splice occurring at diameter larger than the set-point	Splicer emergency spliced because it detected it was losing control of the dancer	Check that the dancer and brake transducers are operating correctly Increase tension
	Diameter calculating incorrectly	Check that the roll stand spindle pulse sensor and the first wrap roller encoder are functioning correctly.

5.2 Nip Head Assemblies

Problem	Possible Cause(s)	Possible Solutions
Assembly not moving as expected.	Cylinders leaking / worn.	Check for air leaks. Loosen cap and inspect pistons for wear or cracks. Re-tighten cap and check for leak on high pressure stage.
	Cam followers need adjustment or are worn.	Adjust cam followers to limit vertical and lateral movement evenly on whole length of adjustment. Replace if worn or broken.
	Hard stops not set correctly.	With high pressure stage active, check if hard stops have ~1/8” clearance from nip head assemblies on both sides. Dump air/lockout, adjust, turn air back on and measure again.

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5.3 Knife

Problem	Possible Cause(s)	Possible Solutions
Knife not moving	Brake cylinders leaking / worn.	Check for air leaks. Loosen cap and inspect pistons for wear or cracks. Re-tighten cap and check for leak on high pressure stage. Inspect knife valves for proper function and air leaks.
Knife hitting backup bar	Knife has too much play as the UHMW guides are worn.	Replace the UHWM guides.
	Backup bar not setup correctly.	Setup the backup bar with ~1/8” below the lower of the two knives evenly across whole length.
Poor cut quality	Knife worn or missing teeth.	Replace knife.
	Backup bar set too low or uneven.	Check setup of knife backup bar. Reset if required.

5.4 Dancer

Problem	Possible Cause(s)	Possible Solutions
Resistance too high	Dancer cylinder worn.	Replace cylinder.
	Cam followers set too tight.	Move dancer to 90% storage. Adjust cam followers until only one touches rail, but no more than 1/8” play allowed across whole length of track.
	Dancer chains too tight.	Loosen dancer chains (see dancer chain setup)
	Dancer cylinder chains too tight.	Loosen dancer cylinder chains (see dancer cylinder chain setup)

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Dancer slowly creeping to exit end	Resistance too high.	See above.
	Roller bearings not turning freely.	Grease bearings or replace if worn.
	Transducer faulty	Investigate if I-to-P transducer displays same value as actually input / output. Replace if faulty.
	Dancer not counting position correctly.	Check dancer encoder, reset sensor for correct functionality.
	Roll Stand brakes not performing as required.	See Roll Stand Maintenance Manual.
	Tension set too low	Increase dancer tension, or splice out earlier

5.5 Motion Sensor Wheel

Problem	Possible Cause(s)	Possible Solutions
Sensors not triggering	Sensors too far away from flag.	Adjust sensors until almost touching sensor flag. Sensors to be on and off equal times. Replace sensors if faulty.
Wheel not turning continuously	Rubber lagging damaged or worn.	Check the rubber for damaged or worn spots. Flat spots will keep wheel from turning. Replace wheel if worn excessively or unevenly.
	Wheel hub seized.	Grease wheel bearings (if applicable). Replace bearings (if applicable) or entire wheel.
Wheel does not stop turning upon paper break	Contact bar set too low.	Adjust the contact bar in front of the wheel to touch paper lightly in normal running condition. Wheel should touch bar as soon as paper breaks.

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