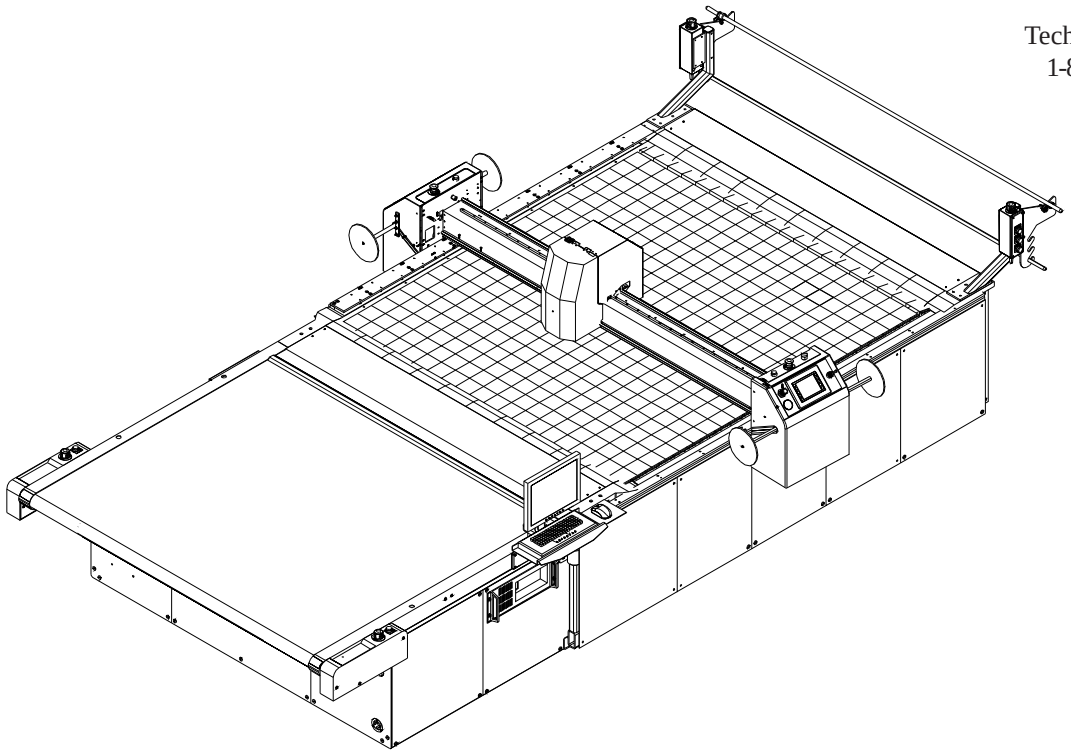
Eastman®

THE EASTMAN ®
Multi-Ply
Automatic Cutting System
Model: MPC 5000
Service Manual

Technical Support:
1-800-872-5595



⚠ WARNING

This machine is equipped with a very sharp knife. Keep hands, arms, and hair away from the knife area at all times.

Misuse of this machine or failure to follow all safety instructions on this machine and in the instruction manual may result in serious personal injuries.

Eastman®
Over a Century of Cutting Expertise

779 Washington St., Buffalo, N.Y. 14203-1396 U.S.A. • (716)856-2200 • Fax (716)856-1140 or (716)856-2068
Manufacturers of Eastman Cloth Cutting and Cloth Spreading Machines
Website: www.EastmanCuts.com

Form E-551

Congratulations

Congratulations in selecting anMulti-Ply Cutter. With over 100 years of experience in the cutting room, Eastman is a world leader in cutting equipment. Every Eastman employee takes pride in each machine we build and back it with unprecedented support. Our Technical Service department is made up of a dedicated staff of professionals with years of experience installing, troubleshooting and servicing the Multi-Ply Cutter. Each technician is familiar with all aspects of the machine including mechanical, electrical and software.

Eastman Machine Company provides technical support and on-site service as required. We offer several affordable Extended Warranty plans that allow you to continue the superior technical support well after the machine is past our standard warranty. If you require on-site technical support or would like to schedule a preventive maintenance visit or need additional training, please call our headquarters in Buffalo, NY to arrange for a technician.

Technical Support

Eastman Machine Company
779 Washington Street
Buffalo, NY 14203
Phone: 716-856-2200
Fax: 716-856-2068

Limited Warranty. Eastman warrants to the buyer that the equipment shall be free from defects in materials or workmanship for a period of 180 days commencing on the date of invoice. Any goods or parts claimed by the buyer to be defective must be returned to Eastman, freight charges prepaid, within the 180 day warranty period. If Eastman determines that the goods or parts are defective in materials or workmanship, Eastman's sole obligation under this warranty shall be, at Eastman's sole option, to repair or replace the defective goods or parts or to provide the buyer credit equal to the portion of the purchase price allocable to the defective goods or parts. This warranty should not apply if defects are caused by product misuse or neglect, if the machine has been altered or modified by the buyer or if other than genuine Eastman parts are used in the machine. THIS WARRANTY IS APPLICABLE TO THIS PURCHASE ONLY. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Limitation of Liability. Eastman's liability to the buyer, and the buyer's remedies from Eastman whether in contract, negligence, under any warranty or otherwise, shall be limited to the remedies provided in the foregoing Limited Warranty. In no event shall Eastman have any responsibility or liability to the buyer for (a) any special, indirect, incidental, or consequential damages, including, but not limited to, loss of use, revenue, or profit even if Eastman has been advised of the possibility of such damages, or (b) any claim against the buyer by any third party. The price stated for the product sold is a consideration for limiting Eastman's liability.

IMPORTANT

The purchaser must instruct all operators on the proper use of this equipment. All standard industrial safety measures and equipment should be provided to protect the operator. Operators must be cautioned that improper or careless use of this equipment may cause personal injury. If you do not have qualified operators to instruct new persons, contact your EASTMAN sales representative or EASTMAN factory direct.

Electrical connections and servicing to this equipment should be made by a qualified electrician who is familiar with applicable codes and regulations. Disconnect this equipment from electrical power source before proceeding with any disassembly for adjustment or repair.

Your Eastman ***Multi-Ply Cutter*** is designed to operate at a high rate speed. All personnel should be instructed to wear safety glasses and stand well clear of the ***Multi-Ply Cutter*** when in operation.

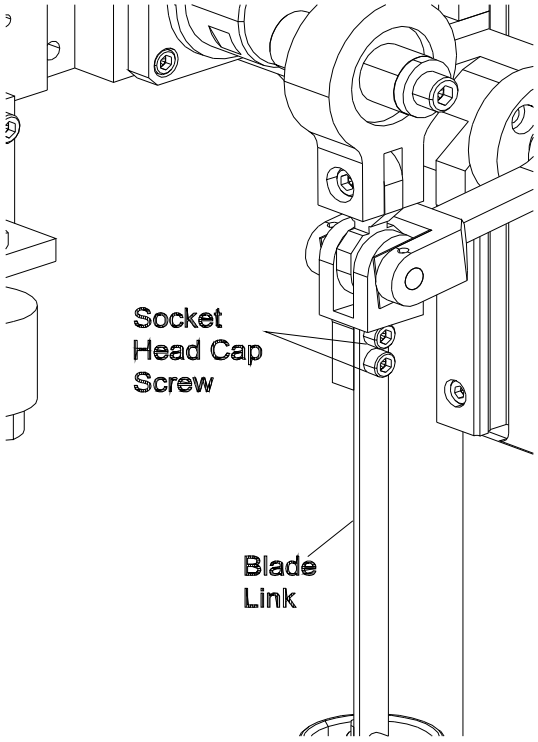
Table of Contents

Instruction for Aligning, Cleaning and Replacing Consumable Parts

Replacement of Knife

Removing the Knife

1. Remove the thumb screw found on the front portion of tool head cover which secures the cover to the tool head.
2. Carefully swing the tool head cover and move it upwards to ensure it is in upper position.
3. Ensure that the reciprocating housing is in upper position.
4. Using allen wrench release the two socket head cap screws from the top of the blade link.

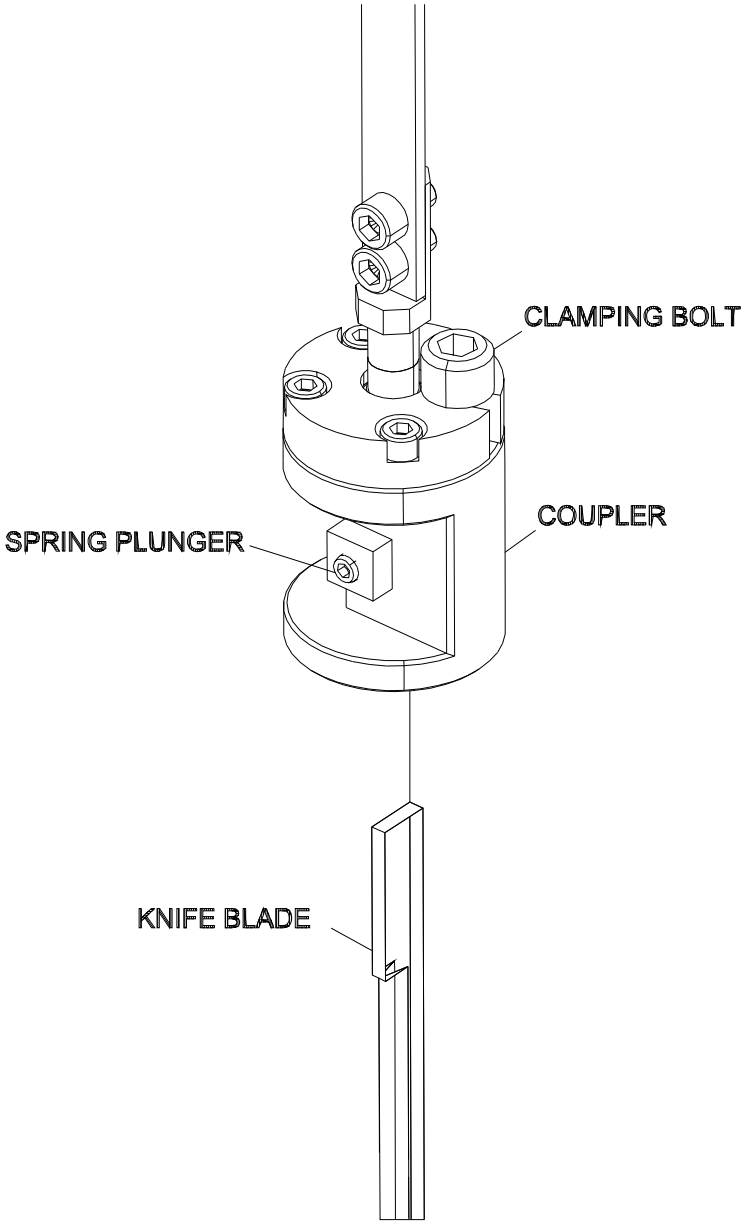


5. Move the blade link upwards along with the coupler assembly and the knife.

6. After the blade link, coupler assembly and knife are completely removed from the reciprocating housing, holding the coupler, loosen the clamping bolt found on the top surface of coupler using allen wrench.

NOTE: The screw will first become slightly lose and easy to turn, then it will become tight. Continue turning after it tightens. It will then become lose again. After it loosens for the second time, the knife can easily be removed.

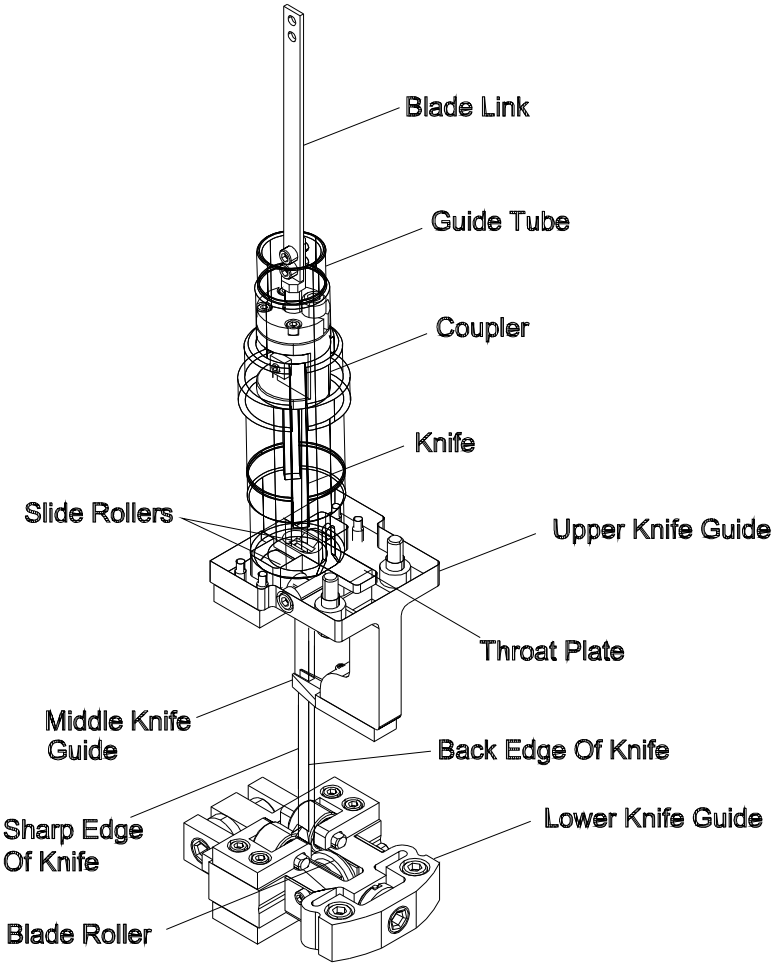
7. Pull the knife away from the coupler being careful to keep hands away from the sharp knife edge.



8. Ensure that the removed knife is placed in a safe area because it contains sharp edges that pose hazards.

Replacing the Knife

1. Insert the new knife into the coupler.
2. Ensure that the sharp edge of knife should face the direction of the spring plunger.
3. Push the knife into the coupler until it stops. Make certain the knife is pushed past the ball plunger detent.
4. Tighten the clamping bolt.
5. Lightly grease the outside diameter of the coupling assembly using Eastman No. 67-26324.
6. Insert the knife along with the coupler and blade link from the top into the reciprocating housing. The below picture shows the knife and coupler assembly installed in the upper, middle and lower knife guide assemblies. While holding the blade link gradually insert the knife along with the coupler into the recipro cating housing guide tube. Ensure that the back edge of knife is facing the lower knife back roller. (The lower knife guide back roller can be seen by pressing down the spring loaded presser foot assembly). The tip of the knife should pass through the rectangular opening in the throat plate found on upper knife guide. Ensure that the knife is kept in the vertical position so that the knife tip passes between the guide
ıntil the coupler engages
ıwered until the upper

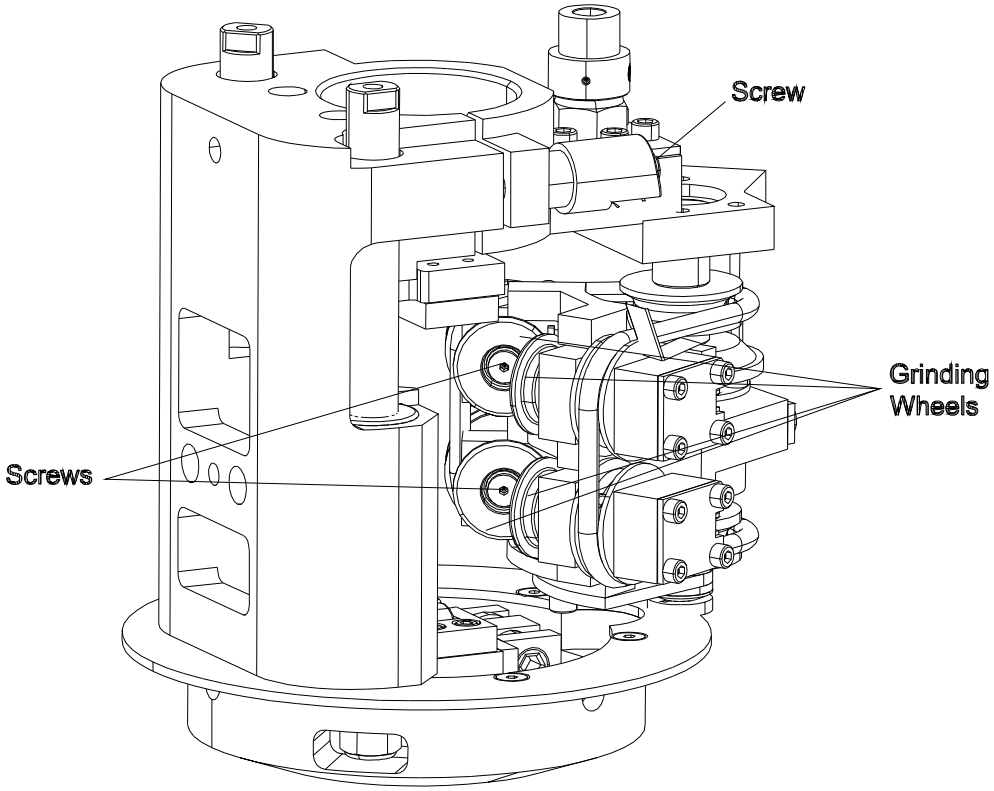


7. After aligning the upper portion of blade link return the two socket head cap screws and secure it using allen key.

Replacement of Sharpening Wheels

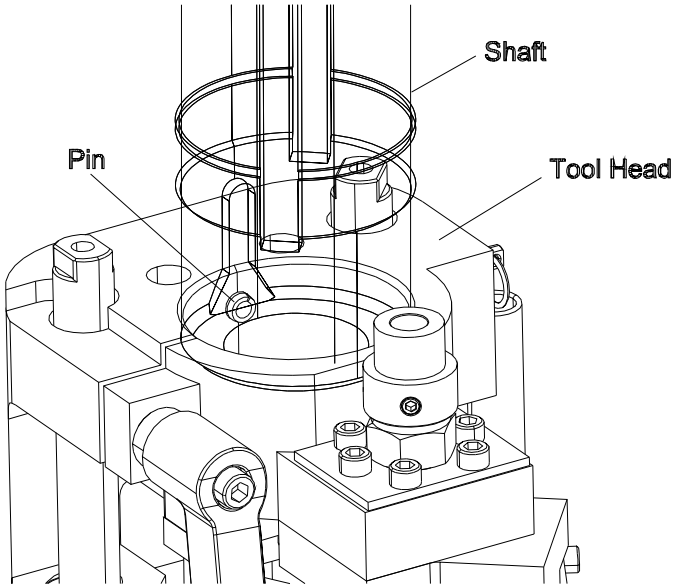
Removing the Sharpening Wheels

1. Remove the thumb screw found on the font portion of tool head cover which secures the cover to the tool head.
2. Carefully swing the tool head cover and move it upwards to ensure it is in upper position.
3. Ensure that the reciprocating housing is in upper position.
4. Using allen wrench release the two socket head cap screws from the top of the blade link.
5. Move the blade link upwards along with the coupler assembly and the knife.
6. After the blade link, coupler assembly and knife are completely removed from the reciprocating housing, remove the rotating tool head assembly as per the instructions below.
7. Disconnect all wires connected to intellicut.
8. Hold the bottom of the rotating tool head in one hand and then release the screw which holds the rotating tool head housing to the shaft.
9. Now rotating tool head drops down.
10. Using allen key remove the screws which hold the sharpening wheels and remove the worn-out sharpening wheels



Replacing the Sharpening Wheels

1. Using a clean dry cloth saturated with alcohol clean the mounting surfaces of the sharpening housing.
2. Apply a few drops of “loctite 222 MS” on the end of screws which hold the sharpening wheels.
3. Install the new sharpening wheels.
4. Return the screws to hold the grinding wheels.
5. Return the rotating tool head and ensure when you put back the tool head on the shaft the pin on the tool head should be aligned to the key way on the shaft (ref image).
6. Raise the tool head after alignment with keyway to upper position until it stops.
7. Tighten the screw which holds the rotating tool head housing to the shaft.



Replacement of Drill Rod

Removing the Drill Rod

1. Remove the thumb screw found on the font portion of tool head cover which secures the cover to the tool head.
2. Carefully swing the tool head cover and move it upwards to ensure it is in upper position.
3. Using the supplied chuck key turn counter clockwise to loosen the drill chuck.

4. After the drill chuck is loosened the drill rod will drop down.

5. Manually lift the drill pressure foot upwards until the drill rod is removable.

Replacing the Drill Rod

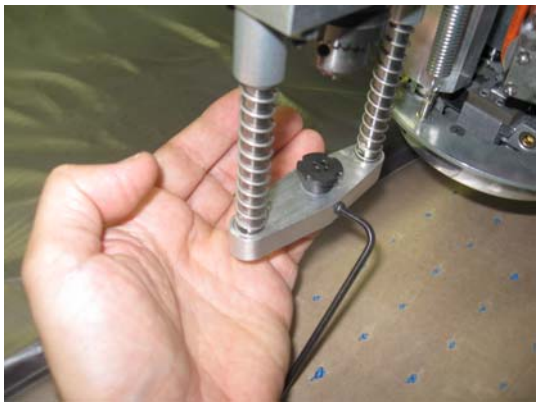
6. Lift the drill pressure foot high enough to install the new drill rod.
7. Insert the new drill rod through the drill bushing into the drill chuck.
8. Hold the drill rod in one hand and tighten the drill chuck using the chuck key as required.

Replacement of Guide Bushing

Removing the Guide Bushing

1. Remove the thumb screw found on the font portion of tool head cover which secures the cover to the tool head.
2. Carefully swing the tool head cover and move it upwards to ensure it is in upper position.
3. Using the supplied chuck key turn counter clockwise to loosen the drill chuck.
4. After the drill chuck is loosened the drill rod will drop down.
5. Manually lift the drill pressure foot upwards until the drill rod is removable.
6. Using allen wrench loosen the set screw found on the drill pressure foot.

7. Using fingers push the drill bush from the bottom of the pressure foot and remove the worn-out guide bushing.



Replacing the Guide Bushing

1. Install the new guide bushing into the hole of the drill pressure foot.
2. Since the guide bushing has (4) different size holes align the correct size hole which matches the drill rod.
3. Rotate the guide bushing until the drill rod is aligned with the hole of the drill chuck.
4. Tighten the set screw on the drill pressure foot and ensure that the drill rod is aligned with the hole in the guide bushing.
5. Tighten the drill chuck after the drill rod is aligned and inserted correctly.

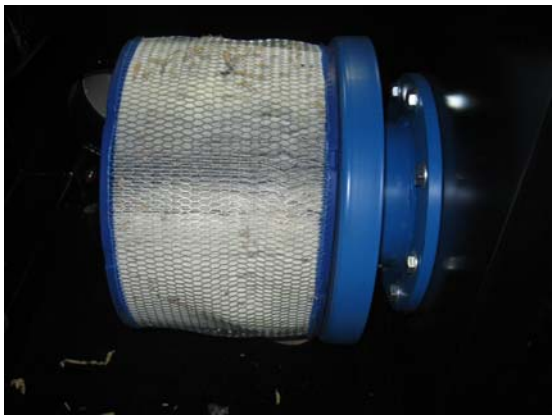
Replacement of Vacuum Filter

Removing the Vacuum Filter

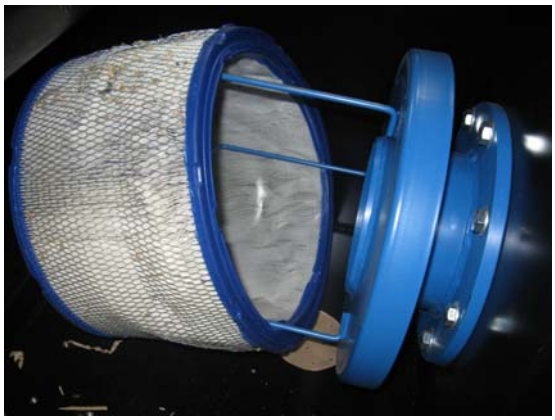
1. Using flat head screw driver remove the screws which hold the filter box cover plate.

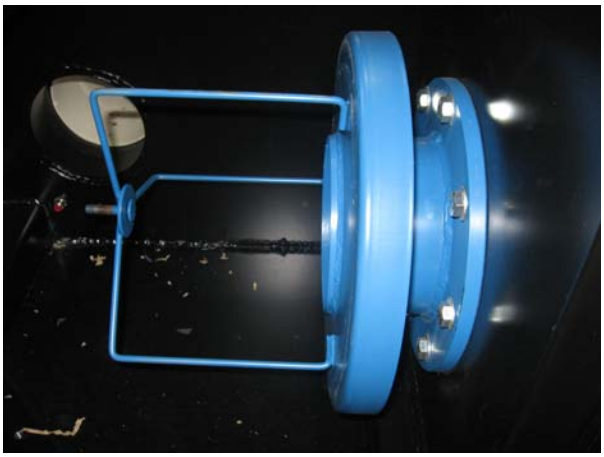
2. Remove the wing nut which holds the filter cover on filter housing.

3. Remove the filter cover from mounting stud.



4. Slide filter cartridge from the filter housing.





5. Shake the cartridge over an open garbage can.

6. Using clean dry compressed air blow out filter until clean.

7. Replace with new filter if required based on inspection.

Replacing the Vacuum Filter

1. Install a new filter.

2. Using vacuum cleaner remove all debris found inside the filter chamber.

3. Return the cleaned filter cartridge and cover the filter housing.

4. Inspect the seal found on the filter box cover for any damage and repair as required.

5. Carefully return the filter box cover plate to the machine and secure it using the mounting screws.

6. Cover the cutting surface with polythene plastic and start the vacuum pump. Check the vacuum level in the software and inspect for any audible leaks. Repair any leaks found.

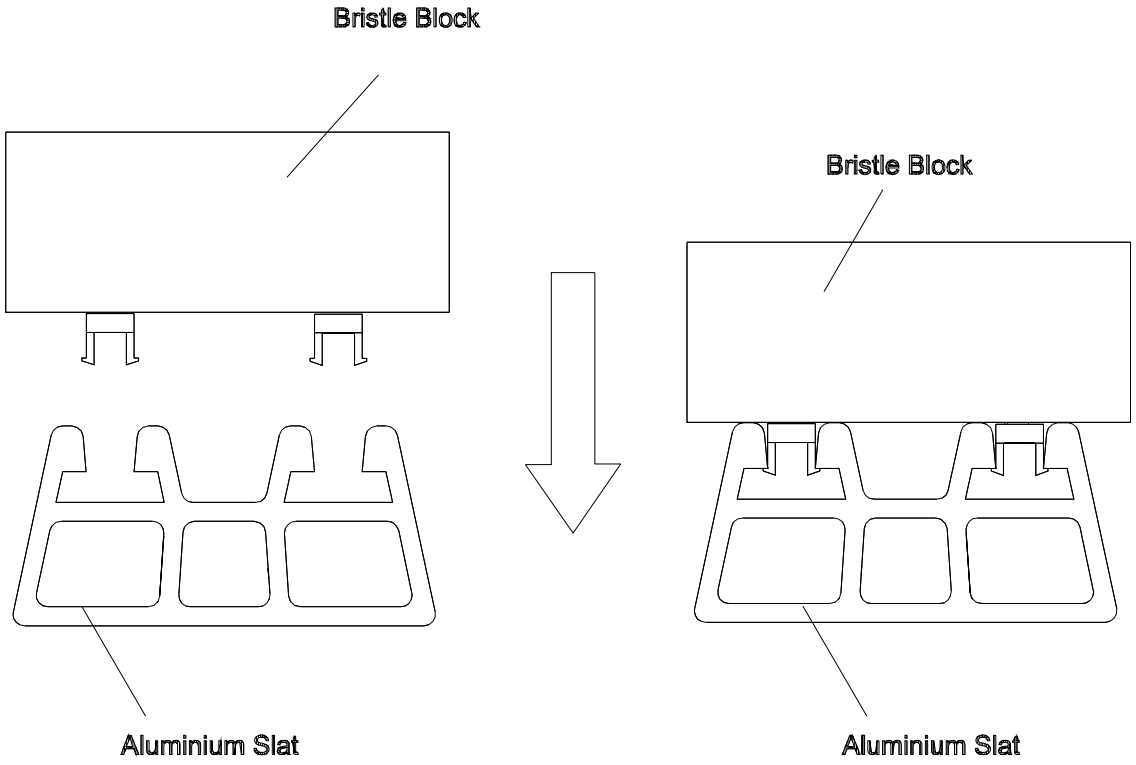
Replacement of Bristle Block

Removing the Bristle Block

1. Advance the conveyor to expose damaged bristle.
2. Apply E-stop to prevent the conveyor and gantry movement for safely.
3. Using a pair of pliers grab the bristle of the bristle block to be removed and pull from its aluminum slot.

Replacing the Bristle Block

1. Install the new bristle block by ensuring that the tab alignment is proper according to the slat arrangement on the aluminum slat. (refer image).
2. Apply pressure on the surface of bristle block so that the mounting tabs snap in the slat found with in the aluminum slat.
3. Release the E-stop allowing conveyor and gantry movement and advance conveyor and inspect the remaining bristle block and replace damaged bristles as required by following the above procedure.



Replacement of Polythene Rolls

Instructions

1. Two persons are required one on either side of the machine.
2. Lift up the bar which holds the plastic overlay tube and set it on flat surface.
3. Pull out the bar from tube and insert into a new roll.
4. Replace the bar on tower and thread under the elevation bar as required.

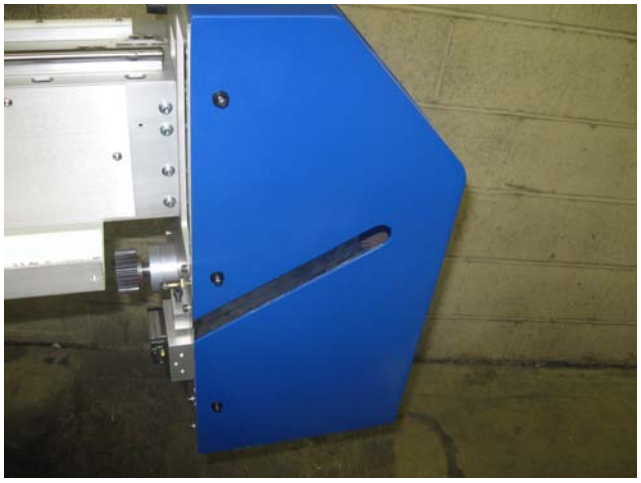
Disassembly and Assembly Instructions for Parts requiring Service

Replacement of X Motor Belts

Removing the X Motor Belts

1. Power down the machine using proper shut down / lock out procedures.

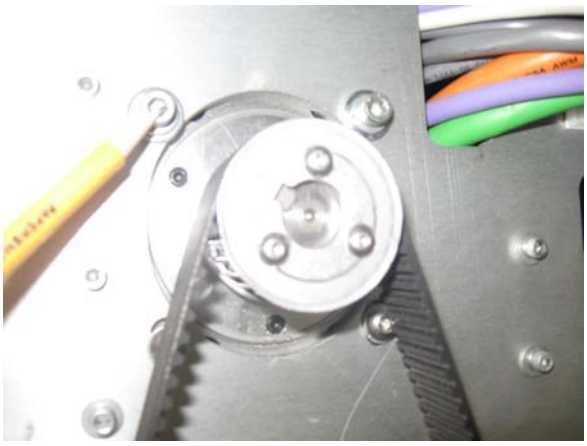
2. Remove the (6) screws using hexagonal wrench found on the left and right side of covers from both the operator and non-operator side of the gantry.



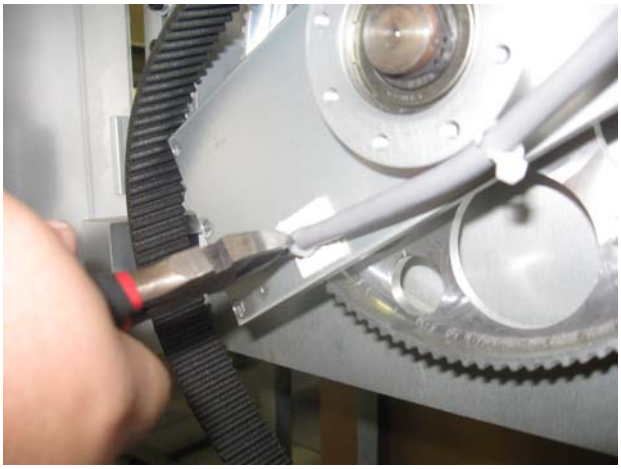
3. Remove the (6) screws using hexagonal wrench found on the control panel from both the operator and non-operator side of the gantry and place the control panel upwards.

4. Remove the (4) screws found on either side of the electronics tray and swing the electronics tray outwards.

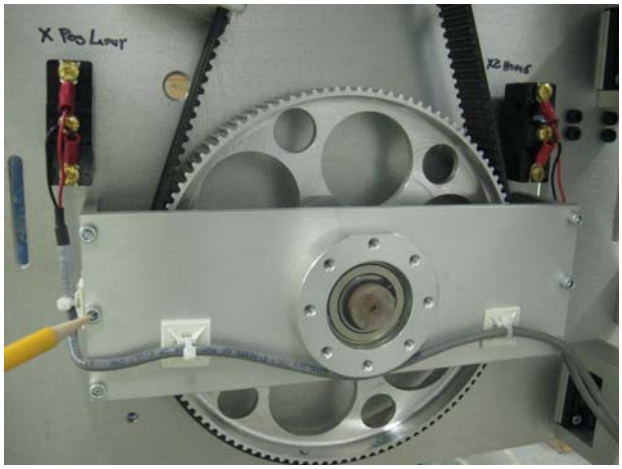
5. Loosen the (4) screws of the motor and now the motor will drop down to loosen the tension on the belt.



6. Cut the (2) zip ties found on the shaft support plate.

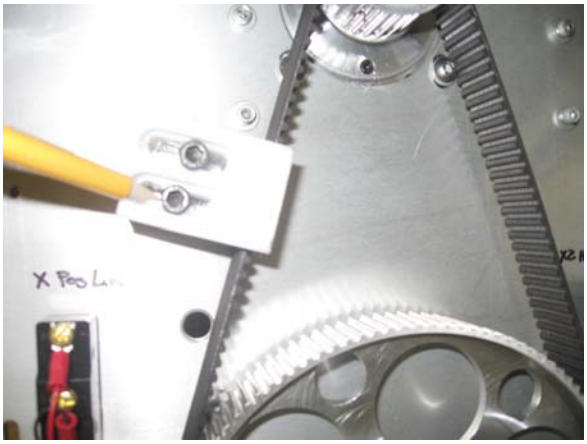


7. Remove the (6) screws found on the shaft support plate.



8. Rotate the shaft support plate to convenient orientation to get access to the belt.

9. Loosen the belt guide and push it outwards so that so that it will help relieve the tension on belt.



10. Remove the worn out belt.

Replacing the X Motor Belts

1. Take a new belt.
2. Put it on the big pulley and roll it on the motor pulley a couple of times until it seats itself.

3. Pick up the motor and put a screw driver under the motor housing and pick up the screw driver to get tension to the belt.

4. Tighten the (4) screws of the motor to get the tension on the belt.
5. Return the (6) screws back on the shaft support plate.
6. Return the (2) zip ties found back on the shaft support plate.
7. Return the control panel and secure it back with the screws.
8. Return the covers of the gantry and secure it back with the screws.

Replacement of Y Motor Belt

Removing the Y Motor Belt

1. Power down the machine using proper shut down / lock out procedures.

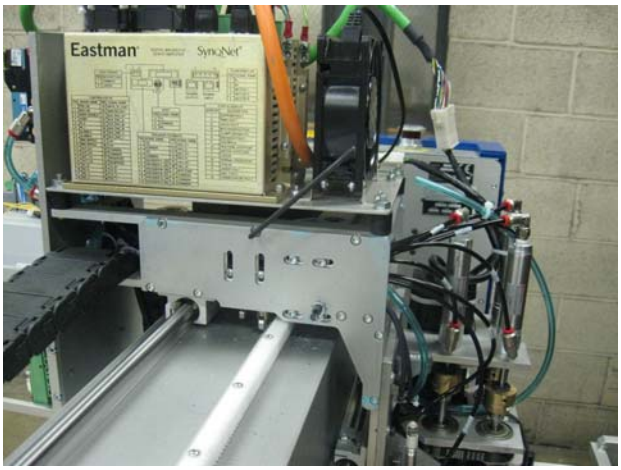
2. Remove the thumb screw found on the front portion of tool head cover which secure the cover to the tool head.

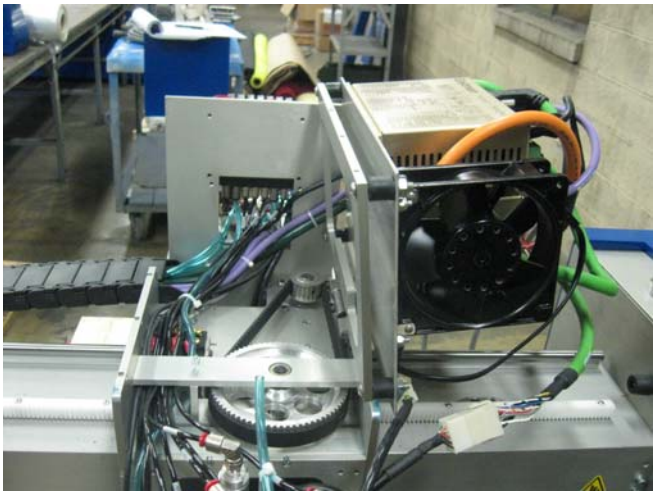
3. Carefully swing the tool head cover and move it upwards to ensure it is in upper position.

4. Remove the two control I/O cables from the I/O block.

Note: the Y amp control I/O cable plugs into J1 and the theta amp control I/O cable plugs into J2.

5. Remove the (3) screws on the operator side of the Y car and slowly open the electronics tray and ensure that no wires interfere.

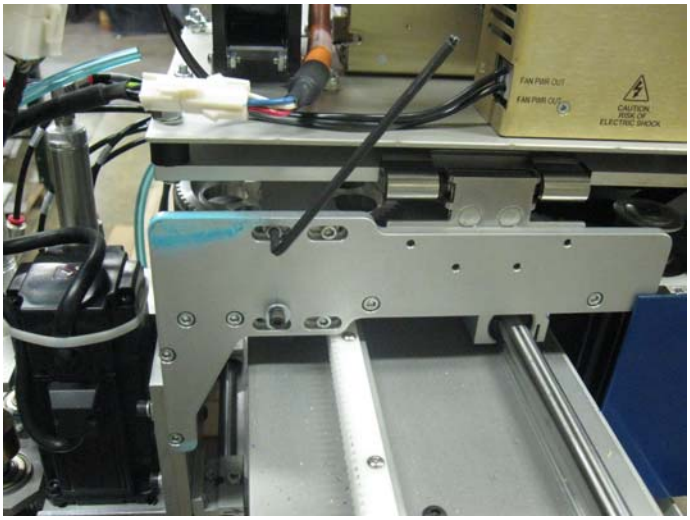




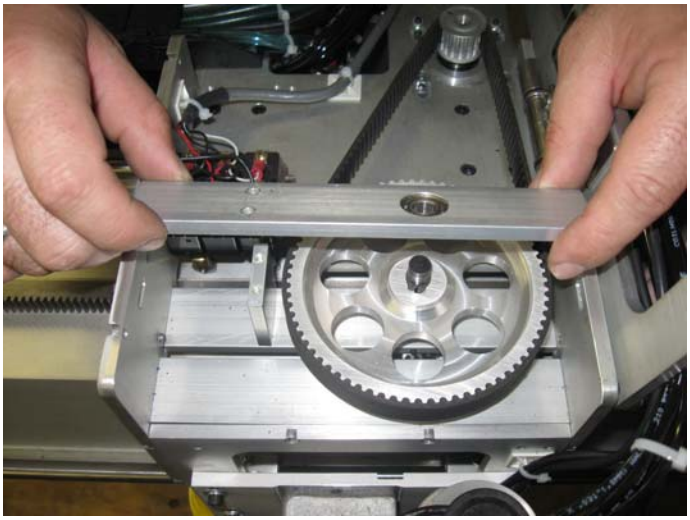
6. Remove the (2) screws found on the operator side on the Y pulley plate.

7. Remove the (2) screws found on the T of the Y pulley plate.

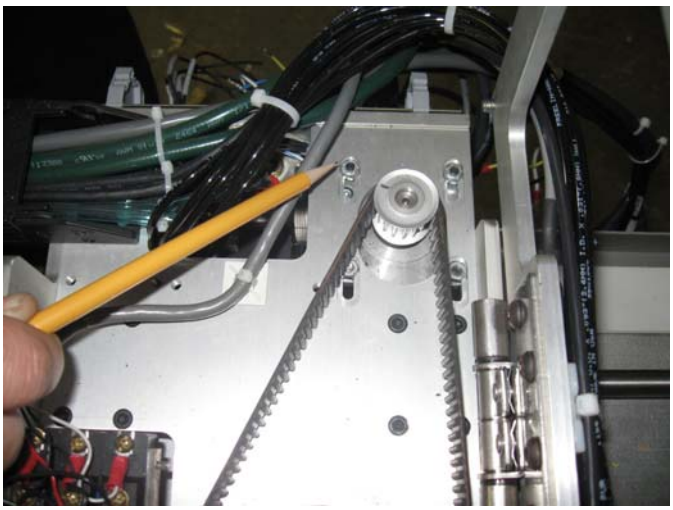
8. Remove the screws found on the non-operator side of Y pulley plate.



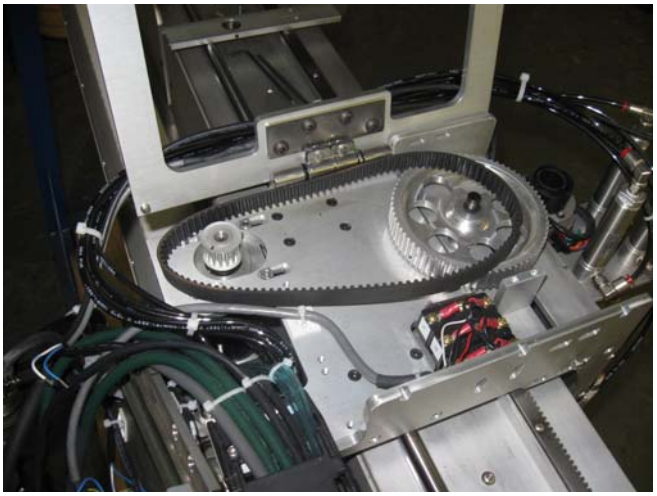
9. Remove the pulley plate.



10. Loosen the (4) screws which hold the Y-motor mounting screws to take off the tension.



11. Loosen the belt and remove the worn out belt.



Replacing the Y Motor Belt

1. Take a new belt.
2. Put it on the big pulley and roll it on the motor pulley a couple of times until it seats itself.
3. Pick up the motor and put a screw driver under the motor housing and pick up the screw driver to get tension to the belt.
4. Tighten the (4) screws of the motor to get the tension on the belt.
5. Return the pulley plate.

6. Return the screws found on the non-operator side of Y pulley plate.

7. Return the (2) screws found on the T of the Y pulley plate.

8. Return the (2) screws found on the operator side on the Y pulley plate.

9. Return the (3) screws on the operator side of the Y car and slowly close the electronics tray and ensure that no wires interfere.

10. Return the two control I/O cables from the I/O block.

11. Secure the tool head top and bottom covers.

Replacement of Theta Motor Belt

On hold for now

Replacing the X-axis Linear Bearings

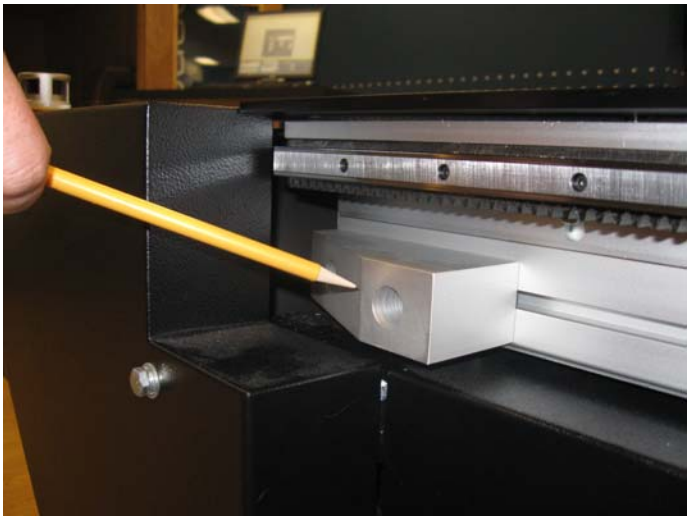
It is important to regularly inspect and replace the linear bearings on the Multi-Ply cutter. Properly maintaining your linear bearings with grease and regular replacement will prevent damage to the linear rails, increase life of spur gears, increase cutting performance and accuracy.

NOTE

All work should be performed by a qualified technician with power turned off to the machine in accordance with company lock out procedures.

Removing Linear Bearings:

1. Power down the machine using the proper shut down/lock out procedures.
2. Remove the covers from both the operator and non-operator side of the gantry.
3. Remove the end stops from all four corners of table.

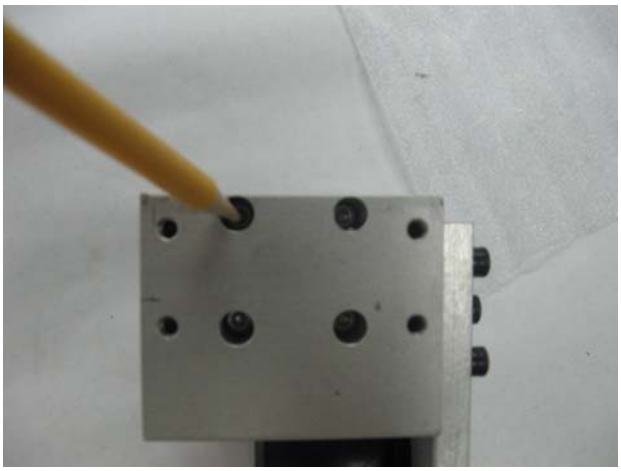


4. Place 2" x 4" wooden blocks under both the operator and non-operator side of gantry.

5. Remove the (4) screws which hold the linear bearing block to the side plate. Repeat this step for all the (4) bearing blocks.

6. Unscrew the backlash adjusting screw from the backlash adjusting block until the gantry is resting on the 2" x 4" wooden blocks.

7. Remove the (4) screws from the bearing block which hold the bearing. Repeat this step for all the (4) bearing blocks.



Installing New Bearings:

1. Remove new bearings from package and press the Zerk grease fitting provided into the bearings. Using a grease gun and the grease gun adapter provided with machine, fill the bearings with white or clear lithium grease.

2. Mount the bearing to the bearing block by securing it with (4) screws. Ensure the grease fitting is pointing to the outside of gantry for easy access.

3. Slide the bearing and bearing block unto the linear rail. Be careful not to damage the bearing seals when mounting on rail.

4. Position the bearing and bearing block directly under each of backlash adjusting screws and replace the screws through the side plate and into the bearing blocks. Do not fully tighten screws until the backlash is adjusted.

5. Begin adjusting the backlash adjusting screws to raise the gantry. Use a level to make sure that both blocks on each side plate are adjusted level to each other.

6. Adjust the backlash adjusting screws until the X-axis spur gear is fully engaged into the gear rack. Pull back and forth on the X-axis belt and ensure that there is no backlash between the gear and gear rack. (The gantry should move immediately when changing belt direction. The gantry should move easily without a dead spot).

7. Tighten the screws which hold the bearing block to the side plate and recheck the backlash. Re-adjust the backlash if necessary.

Replacing the Y-axis Top Linear Bearings

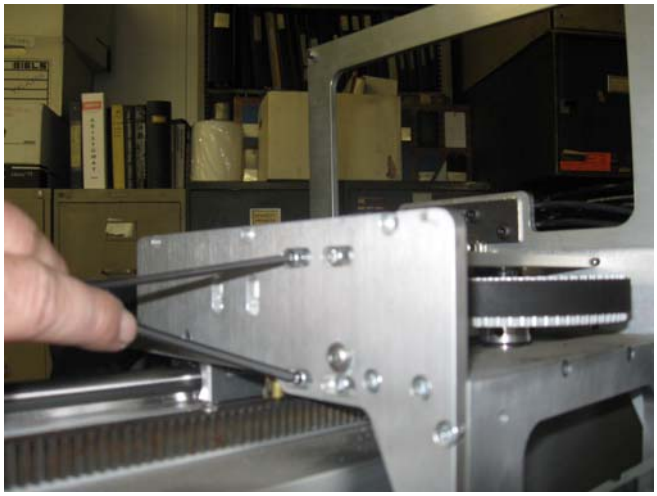
It is important to regularly inspect and replace the linear bearings on the Multi-Ply Cutter. Properly maintaining your linear bearings with grease and regular replacement will prevent damage to the linear rails, increase life of spur gears, increase cutting performance and accuracy.

NOTE

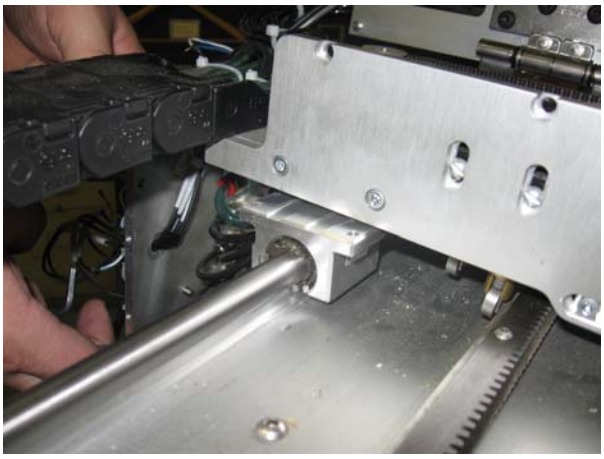
All work should be performed by a qualified technician with power turned off to the machine in accordance with company lock out procedures.

Removing Linear Bearings:

1. Power down the machine using the proper shut down/lock out procedures.
2. Remove the front and rear covers of the tool head found on the Y car of the gantry.
3. Remove the (8) screws found on the Y car which secure the linear bearings to the Y-car.

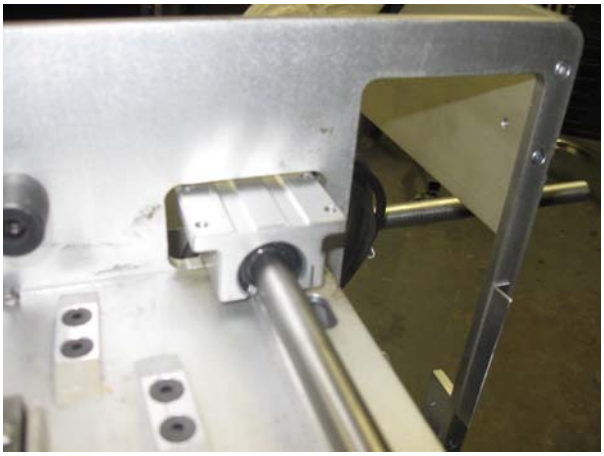


4. Lift the Y car slightly.



5. Slide the (2) bearings out towards the operator side.

6. Slide the (2) bearings out towards the operator side plate and remove them through the access relief / cutout.



Installing New Bearings:

1. Remove new bearings from package and press the Zerk grease fitting provided into the bearings. Using a grease gun and the grease gun adapter provided with machine, fill the bearings with white or clear lithium grease.

2. Slide the new bearings unto the linear rail and ensure that bearing adjustment screws are accessible from the back of gantry.

3. Be careful not to damage the bearing seals while mounting on the linear rail.

4. Slide the bearings under the Y-car ad align with the mounting holes and secure back the (8) screws.

5. After the replacement of new bearings check for the Y car backlash and adjust as required.

6. Please note: bearing replacement may effect Y-car cutting calibration.

Replacing the Y-axis Front Linear Bearings

It is important to regularly inspect and replace the linear bearings on the Multi-Ply Cutter. Properly maintaining your linear bearings with grease and regular replacement will prevent damage to the linear rails, increase life of spur gears, increase cutting performance and accuracy.

NOTE

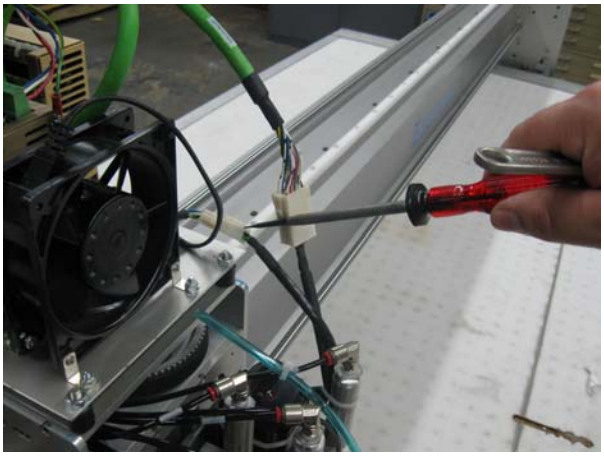
All work should be performed by a qualified technician with power turned off to the machine in accordance with company lock out procedures.

Removing Linear Bearings:

1. Power down the machine using the proper shut down/lock out procedures.
2. Remove the top and bottom covers of the tool head found on the Y car of the gantry.
3. Identify all air lines marking them for spindle location and function if not already marked.

4. Disconnect all air lines by depressing the red color buttons and slightly pulling on the air lines.

5. Disconnect the theta motor cable and theta feedback cable.

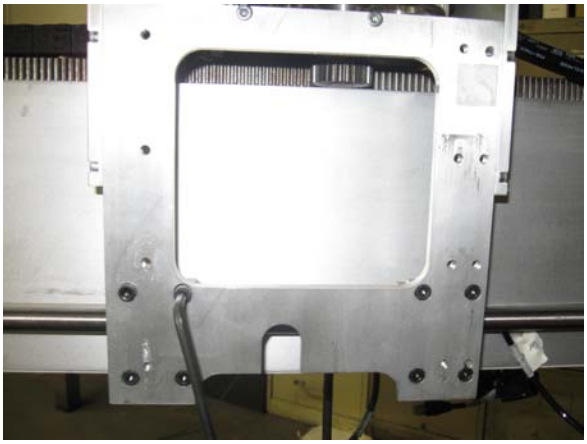


6. Remove the (6) screws which secure the tool head to the Y-car assembly.

7. Disconnect the laser pointer wiring from the back of Y-car assembly.

8. Disconnect the positional sensor from the back of Y-car assembly.

9. Remove the (8) screws which secure the linear bearings to the tool head interface plate.



10. Lift the Y car slightly.

11. Slide the (2) bearings out towards the operator side.

12. Slide the (2) bearings out towards the operator side plate and remove them through the access relief / cutout.

Installing New Bearings:

1. Remove new bearings from package and press the Zerk grease fitting provided into the bearings. Using a grease gun and the grease gun adapter provided with machine, fill the bearings with white or clear lithium grease.

2. Slide the new bearings unto the linear rail and ensure that bearing adjustment screws are accessible from the top of gantry.

3. Be careful not to damage the bearing seals while mounting on the linear rail.

4. Slide the bearings under the Y-car and align with the mounting holes and secure back the (8) screws.

5. After the replacement of new bearings check for the Y car backlash and adjust as required.

6. Please note: bearing replacement may effect Y-car cutting calibration.

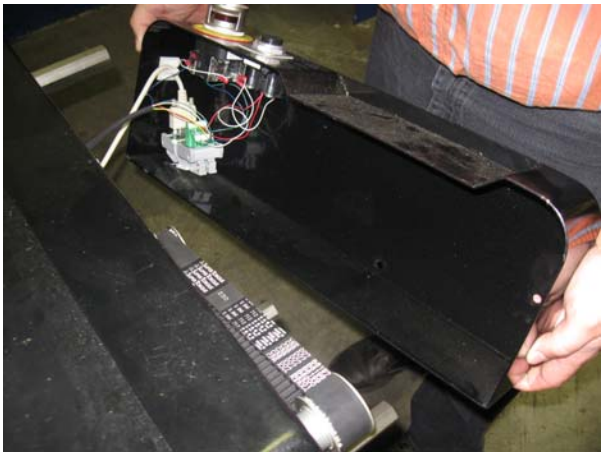
Replacing of Take-off Conveyor Drive Belt

Removing the Take-off Conveyor Drive Belt

1. Power down the machine using the proper lock out / tag lock out procedures.

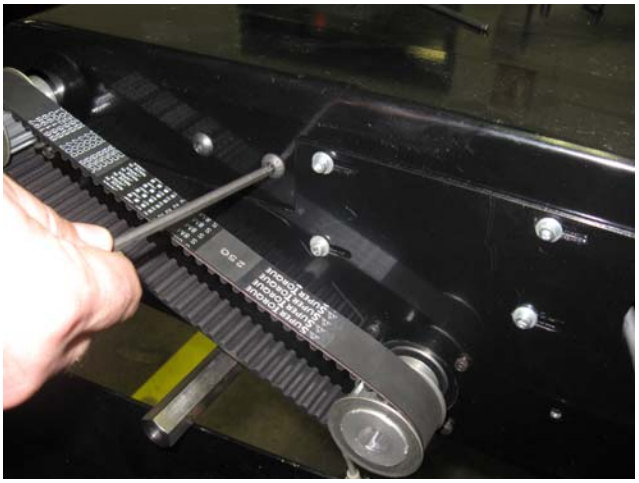
2. Remove the (3) allen screws which secure the cover to the assembly on the operator side.

3. Carefully remove the cover without disturbing the electronics connection.

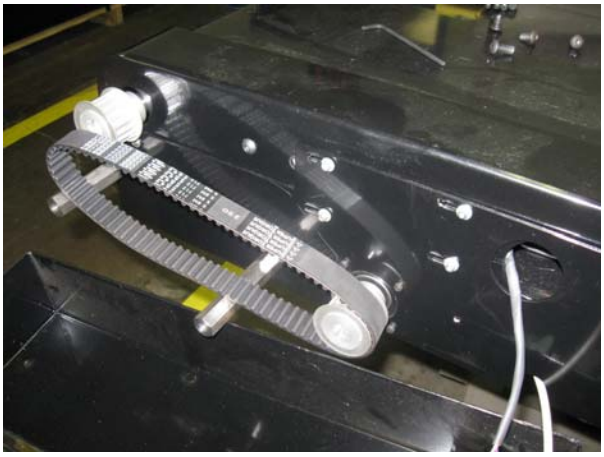


4. Loosen the (4) screws found on the side support.

5. Remove the allen screw found on the end cover for additional clearance.



6. Slide the motor plate to the left and remove the belt.



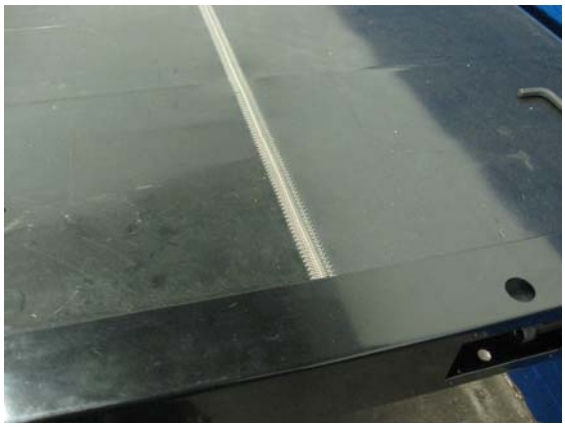
Replacing of Take-off Conveyor Drive Belt

1. Install new belt by sliding the belt on to the motor pulley first and then to the drive pulley.
2. Slide the motor mount plate to the right to tension the belt until a ¼" belt deflection is achieved.
3. Install the allen screw which is removed for clearance.
4. Tighten the (4) screws found on the side support.
5. Return the cover to the assembly.
6. Re-install the (3) allen screws to the cover.

Replacing of Take-off Conveyor Belt

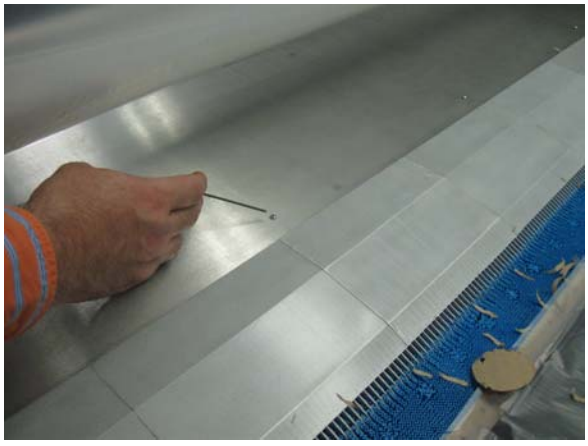
Removing the Take-off Conveyor Belt

1. Advance the conveyor belt until the zipper seam is exposed.



2. Power down the machine using the proper lock out / tag lock out procedures.

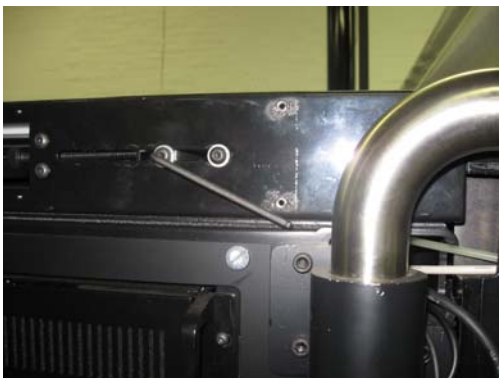
3. Remove the (7) screws found on the take-off transfer plate.



4. Remove the transfer plate exposing the take-off conveyor tension roller.

5. Remove the (4) screws found on the tension assembly cover plate which is located at the front on the operator side.

6. Loosen the (2) screws found on the side frame.

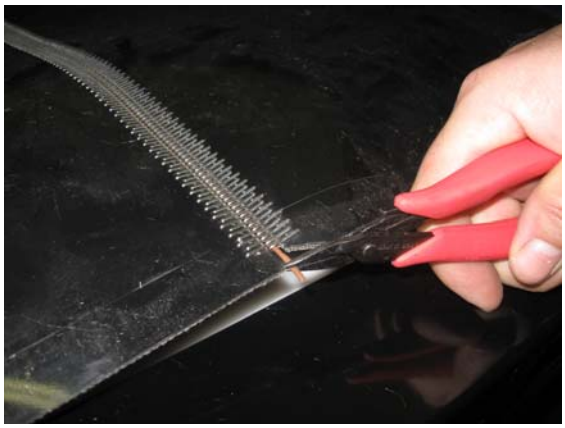


7. Loosen the tension jack screw to release tension on the belt.

8. Repeat steps 5 through 7 on non-operator side.

9. Using a pry bar or screw driver pull up the belt exposing the edge where the zipper seam is exposed.

10. Using pliers pull the seam wire from the zipper seam. When the seam wire is removed the belt will come apart.



11. Remove the belt from conveyor.

12. Clean the wear surfaces found under the belt with a clean dry cotton rag.

Replacing of Take-off Conveyor Belt

1. Install the new belt back on the conveyor surface in the same way as it was removed. Ensure that the belt is underneath the lip of the side frame except for 10" on either side of the belt seam on both the operator side and non-operator side.

2. Align the zipper fingers so that the belt edge is straight.

3. Thread the seam wire through the over lapped zippers fingers.

4. Trim the excess seam wire to flush with edge of belt on both the operator side and non-operator side.

5. Tuck the belt under side frame so that no edge of belt is exposed.

6. Tighten the tension jack screw on both the operator side and non-operator side of the conveyor frame so that the belt is tight enough to drive and not rub on the blower frame below.

Note: if the belt is tensioned too much conveyor fault(s) may occur.

7. Tighten the (2) screws found on the side frame.

8. Re-Install the (4) screws on the tension assembly cover plate which is located at the front on the operator side.

9. Re-install the transfer plate and secure it with the same (7) screws on the take-off transfer plate.

10. Power up the machine and confirm if there is sufficient tension available to drive the belt else adjust the tension as required

Replacing the XMP Controller Card and Loading Configuration Files

The Multi-Ply Cutter uses one XMP Controller card located inside the Computer. The XMP controller card communicates over the purple network cables with all of the Motor Amplifiers and the Slice Input/Output (IO) cards. This communication results in coordinated motion between the Gantry Cutting Tools and the Conveyor System insuring the most accurate cutting possible. The Configuration Files contain parameters for each node on the network (Controller Card, Amp, Slice IO, etc.).

In the rare case that a Controller Card needs replacement, the loading of the proper Configuration Files should be done with the help of Eastman's Technical Service Department. If the Multi-Ply Machine's Computer is hooked up to the internet, Eastman's Technical Service Department has the capability of remotely accessing your machine through the internet and loading the proper files for you. If not, technical service can be provided over the phone.

Do not attempt to load the files yourself. Improper parameters can result in unpredictable machine operation. This may cause damage to your machine or injury to an operator.

Adjustment Procedures and Specifications for parts requiring Service

Checking and Adjusting Gantry Backlash

This procedure ensures that the gantry drive gears are properly engaged to the gear racks so that pieces are accurately processed on the automated cutting machine. Performing this procedure also helps to minimize wear, repair, and replacement of gantry drive components. Any excessive backlash will result in accuracy issues observed in the cut piece.

Checking Gantry Backlash

1. Power-up automated cutting machine, zero the table, & move gantry to center of table.

2. Stand in front of operator side of gantry & alternately push from left to right against rear top corners of cover assembly – enabled gantry drive motors will resist movement.

3. If there is any free side-to-side movement their exist a backlash.

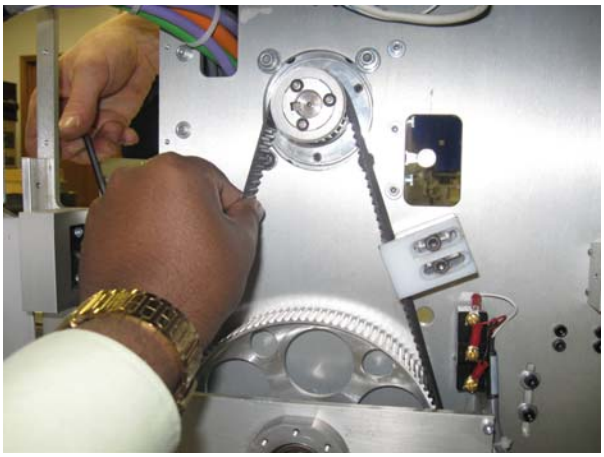
4. Repeat steps 1 thru 3 for non-operator side of gantry.

5. If free side-to-side movement is detected (backlash)

   a) Turn off main power switch on the control cabinet.

   b) Remove cover to access drive belt.

   c) Pinch gantry drive belt & lightly pull it up & down, but not enough to move gantry.



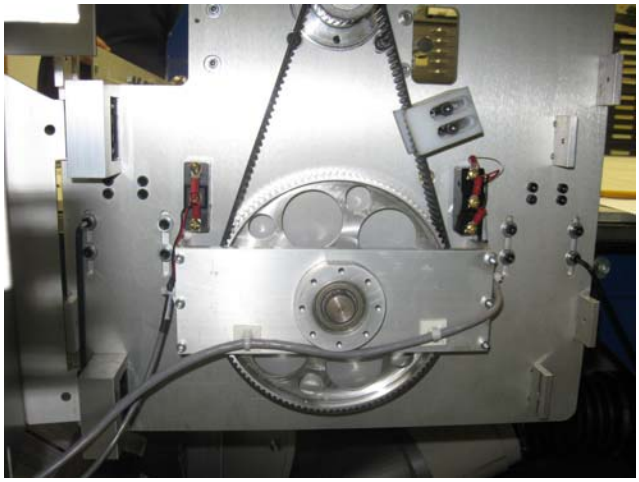
d) If no free movement in drive belt is found then backlash is okay. Replace cover assembly, ensure cable is reconnected.

e) If free movement in drive belt is found then adjust the gantry backlash.

Adjusting Gantry Backlash

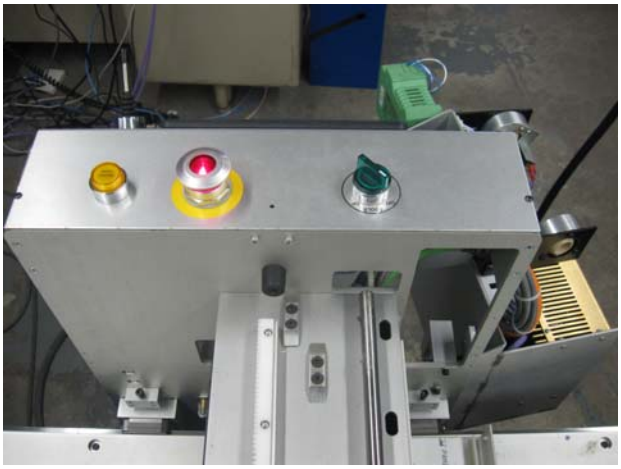
1. Remove all screws from gantry E-chain cover allen wrench & remove cover. (Although this step is not required, it allows for easier access & adjustment).

2. Slightly loosen eight (8) screws holding two (2) rail car connectors to gantry side plates using an allen wrench.



3. Place a level across top edge of the gantry side plate.

4. Using an allen wrench, turn each of two (2) backlash adjusting screws ¼-turn clockwise into backlash adjuster block, raising gantry side plate, & raising gantry drive gear tighter into gear rack. Adjust screws so that gantry side plate remains level.



5. Recheck gantry drive belt backlash. Repeat adjustment until free movement in drive is eliminated. Do not over-tighten backlash else gantry movement will be restricted, causing amp faults & excessive drive component wear.

6. Retighten eight (8) screws holding two (2) rail car connectors to gantry side plates.

7. Recheck drive belt backlash again & readjust if necessary.

8. Replace gantry cover.

9. Perform the same procedure for non-operator side of gantry.

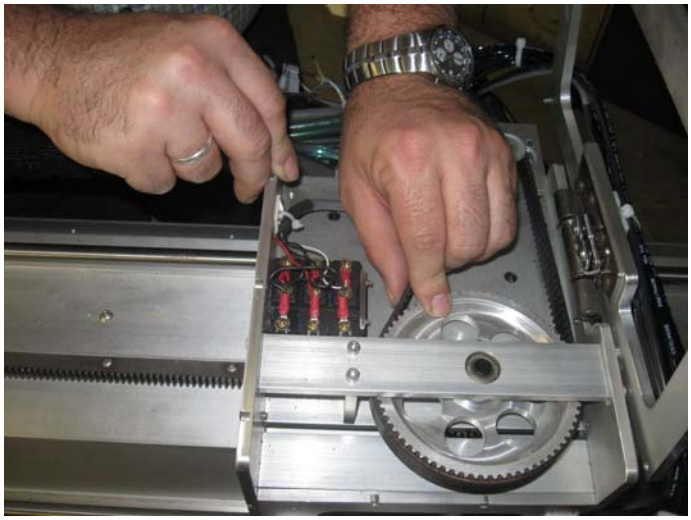
10. Replace E-chain cover.

Checking and Adjusting Y-car Backlash

Checking Y-car Backlash

1. Power down the machine using proper shut down / lock out procedures.

2. Hold the pulley and move the Y-car back and forth in Y direction and observe if there is any audible click or movement.

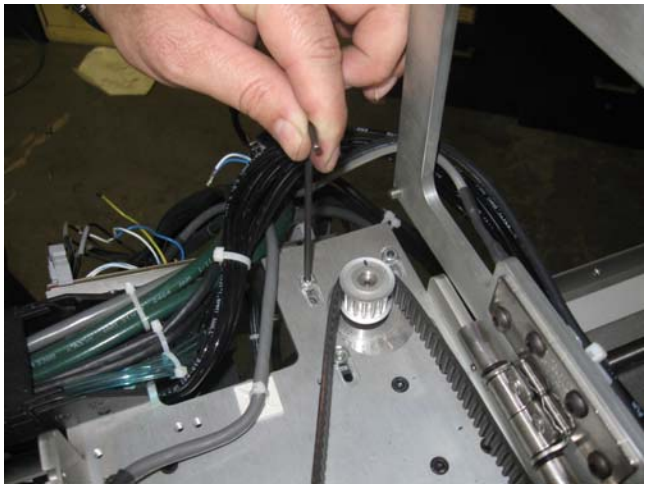


3. If there is any free side-to-side movement their exist backlash.

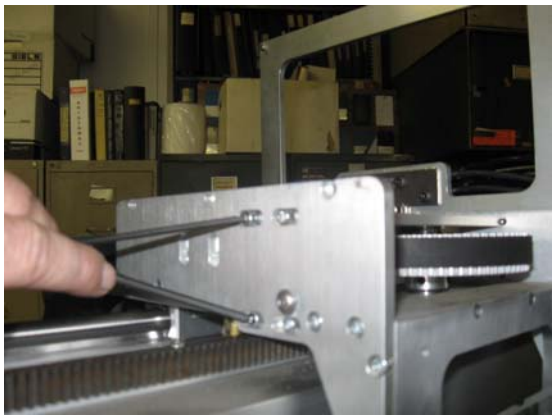
4. If free movement in drive belt is found then adjust the Y-car backlash.

Adjusting Y-car Backlash

1. Loosen motor mount bolts to relieve tension on drive belt.



2. Loosen the (4) screws of the pulley plate on either side of the Y-car.

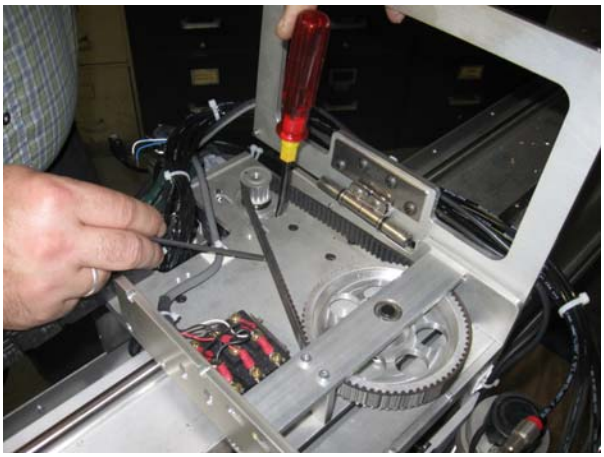


3. Tighten the (4) screws of the pulley plates on the non-operator side of Y-car.

4. Pull the pulley plate towards the linear rack and tighten the (4) screws of the pulley plates found on the operator side.

5. Ensure that all the (10) screws of the pulley plates are secured.

6. Using a screw driver or pry-bar apply pressure to motor belt to displace motor belt. Tighten the motor until there is no belt deflection.



7. Tighten the motor mounting screws.

8. Please note when ever the belt is replaced the backlash adjustment should follow.

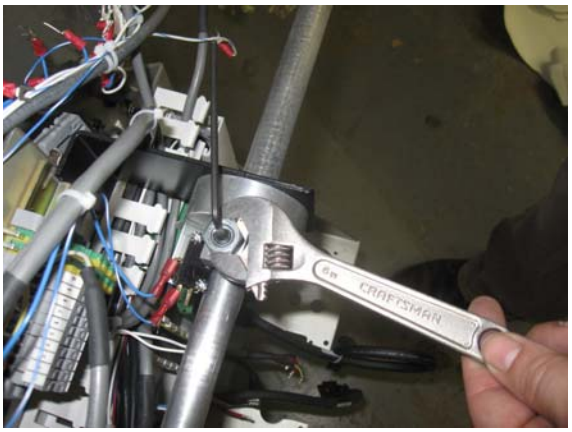
Checking and Adjusting Stop Discs

Checking Stop Discs

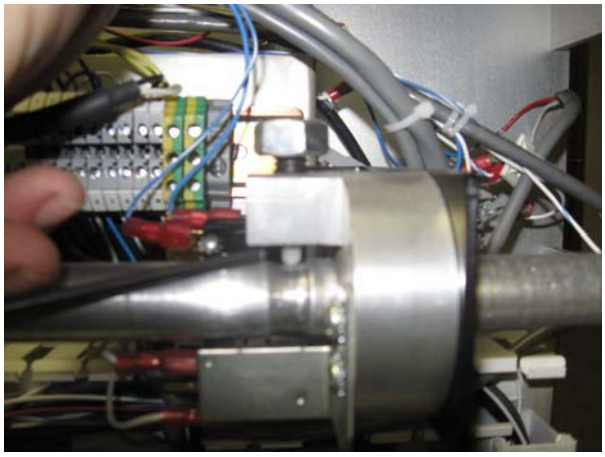
1. Power up the machine.
2. Move the stop discs to see if they are activated by a slight touch or vibration.
3. If the stop discs are not activated by slight touch or movement are then adjust the stop discs.

Adjusting Stop Discs

1. Remove the operator side cover which will expose the stop disc mechanism.
2. Check the plunger by the pause switch on the stop disc.
3. Loosen the nut while holding the set screw with allen key.



4. Tighten the set screw which in turn increases the force on the detent ball until sufficient tension is applied to the stop disc rod.



5. Tighten the nut while holding the set screw in position.

6. Return the cover.

7. Check the operation of stop disc.

8. Do the same check on non-operator side.

Scheduled Maintenance Procedure

⚠ CAUTION

It is important to perform regular maintenance on the equipment. A daily, weekly and monthly schedule should be maintained. Failure to do so can result in more frequent breakdowns damage to equipment and/or injury.

Proper Maintenance will help to ensure the reliable operation of your Multi-Ply cutter. You should allow 5 to 10 minutes for daily inspection, 30 minute weekly inspection and one hour monthly inspection. Time invested on these tasks will minimize downtime. Eastman Machine Company is not liable for damage as a result of poor maintenance and any resulting damage would be repaired at user's expense. All maintenance should be performed by qualified personnel, following all safety procedures. The following is the recommended maintenance schedule:

Daily Maintenance

- At the start of each shift, carefully inspect the machine and cutting surface. Look for any debris, loose cables or any other obstruction that may interfere with machine movement or cutting. Vacuum bristle surface as required to remove dust and dirt which may clog perforations.
- After the Multi-Ply cutter is powered up, check both the X and Y axes for backlash. If the backlash is excessive on either axis, adjust as required.
- Check connecting link to verify that it is securely fastened to reciprocating assembly. Check blade edges for nicks and replace as required. Ensure that the knife is securely fastened to the coupler.
- At the end of each work session make sure the computer is off. Clean-up debris from table and remove any CD or Disks from the disk drives.
- At the end of the day disconnect power to the machine.
- At the end of the day press the spring loaded presser foot of the sharpening assembly and using dry compressed air blow of any loose dust and debris found on the knife guide assemblies and within the sharpening housing. Using soft bristle brush clean all accessible surfaces and knife guide assemblies. Again blow of any loose dust and debris found after cleaning with bristle brush.

Weekly or every 40 hours

⚠ CAUTION

Before performing the weekly tasks make sure the Multi-Ply cutter and computer are turned off at the electrical disconnect and locked out.

- Lubricate table rail linear bearing with Eastman lubricant 67-26325 (Mobil: SEA 10 Non-detergent Vactra No. 1) See Lubrication Chart.
- Lubricate gantry rail linear bearing with Eastman lubricant 67-26325 (Mobil: SEA 10 Non-detergent Vactra No. 1) See Lubrication Chart.

- Lubricate table linear bearings with Eastman Lubricant 67-26324 (Mobil: NLG1 Grade 2 Moblith AW-2).
- Lubricate knife coupling with Eastman Lubricant 67-26324.
- Using compressed air, clean dust and debris from inside of Y-car.
- Use clean cloth to wipe down Y-axis rails and lubricate.
- Tighten any loose fasteners on the Y-car.
- Remove the tool head cover from the Y-car. Inspect the cutting head assembly. Look for any wires or air hoses rubbing or wearing.
- Rotate presser foot assembly by hand, it should rotate freely and be without any play relative to tool head base plate.
- Check belt deflection both in reciprocating drive belt and theta drive belt. Excessive deflection will need belt adjustment or replacement as required.

First Working Day of Month

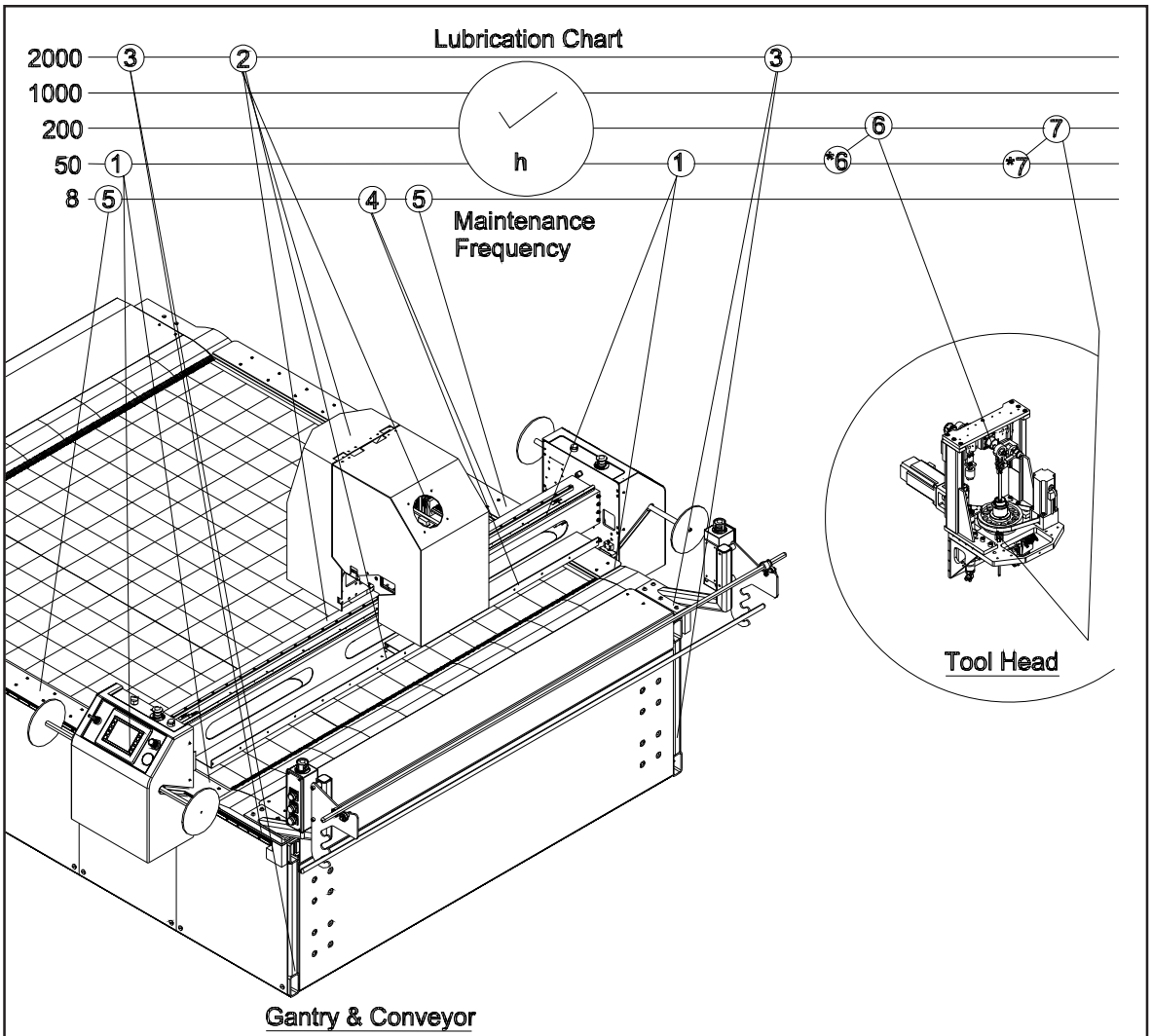
⚠ CAUTION

Before performing the weekly tasks make sure the Multi-Ply cutter and computer are turned off at the electrical disconnect and locked out.

- Remove gantry covers and inspect electrical connections to make sure tight.
- Inspect all 24 VDC power supply connectors for any discoloration or signs of heating.
- Check Drive belts for signs of wear such as cuts, frays or missing teeth. Replace if required.
- Check belt tension. Belt should be tight enough to prevent backlash between drive pulley and driven pulley.
- Check all shafts and pulleys. Pulleys need to be seated tightly on the shaft.
- Check all electrical plugs and connectors to ensure they are securely fastened

Lubrication Chart

Below are the lubrication points for the Multi-Ply Cutter.



Machine Component	Gantry	Y-Car	Conveyor Base	Gantry	Conveyor Rail	Standard Tool Head		Recipricating Tool Head	
Nature of Action / Action Point	1	2	3	4	5	6	7	*6	*7
Clean & Lube				8	8	200	200	*50	*50
Replenish	50	2000	2000						
Libricant Designation	Mobil: NLG1 Grade 2 Moblith AW-2			Mobil: SAE 10 Non-detergent Vactra No. 1		Loctite: Krytox PFPE Lubricant mfg# 29711			
Eastman No.	67-26324			67-26325		67-26009			

* Recipricating tool head option only.

Yearly Maintenance Checklist for Multi-Ply

Below is the recommended maintenance checklist for the Multi-Ply Cutter. It provides a good guideline for yearly maintenance and can be copied and kept as a maintenance log.

Cable Assembly	Comments	Signoff
Check X-Axis cable festoon assembly (Loose connections or wear in cables)		
Main AC power cable		
Gantry power cable (green)		
a) SynqNet In		
b) SynqNet Out		
c) UIT		
d) Gantry I/O		
e) Gantry Power		
f) Air Hose		

Front Cover Assembly	Comments	Signoff
Verify Stop Discs are operational.		
Check Emergency Stop switch, wiring & light bulb		
Check Pause switch, wiring & light bulb		
Check limit switch & switch bracket		

Back Cover Assembly	Comments	Signoff
Verify Stop Discs are operational.		
Check Emergency Stop switch, wiring & light bulb		
Check Pause switch, wiring & light bulb		
Check limit switch & switch bracket		

Control Panel Assembly	Comments	Signoff
Check U.I.T. control assembly & cables		
Check the joy stick for proper operation		
Check tools on/off switch, wiring & light bulb		
Check & Secure all screws		
Check Presser foot air regulator & air pressure guage for proper operation		

Front End Plate Assembly	Comments	Signoff
Inspect drive belt (cracks, thread separation)		
Check & oil large pulley bearings		
Check X1 home switch & wiring		
Check X-ve limit switch & wiring		
Check wiring for 24V DC power supplies (Verify 24V DC power)		
Check & Secure all set screws		
a) Large Pulley		
b) X1 Motor drive pulley		
c) Spur gear		
Remove & inspect THK linear bearings(2)		
Check that the electronics tray is securely fastened to front end plate on both sides		
Check wiring and cables for any wear, cracks or loose connections		
Check all screw terminals to ensure that wiring is secure		
Check & adjust backlash for X1 motor assembly		
Check & Secure all screws		

Back End Plate Assembly	Comments	Signoff
Inspect drive belt (cracks, thread separation)		
Check & oil large pulley bearings		
Check X2 home switch & wiring		
Check X +ve Limit switch & wiring		
Check & Secure all set screws		
a) Large Pulley		
b) X2 Motor drive pulley		
c) Spur gear		
Remove & inspect THK linear bearings(2)		
Inspect all cable connections into gantry from X-axis E-chain		
a) SynqNet In		
b) SynqNet Out		
c) UIT		
d) Gantry I/O		
e) Gantry Power		
f) Air Hose		
Check that the electronics tray is securely fastened to front end plate on both sides		
Check wiring and cables for any wear, cracks or loose connections		
Check all screw terminals to ensure that wiring is secure		
Check cable mount & E-chain mount		
Check & adjust backlash for X2 motor assembly		
Check and secure all screws		

Conveyor	Comments	Signoff
Examine Surface for damaged bristles		
Check Vacuum Pressure (Under 90" Water with Table Uncovered)		
Inspect edge seals for damage		
Check clean condition and lubrication		
Check excessive tooth wear on drive sprockets		
Inspect condition drive bearings		
Inspect condition of roller bed surface		

Main Tube Assembly	Comments	Signoff
Check Y-Home switch and cam for proper operation		
Check Y +ve and Y -ve limit switch & cam for proper operation		
Check Y E-chain cables		
a) Y-car power cable filtered		
b) SynqNet In		
c) SynqNet out		
d) UIT		
e) Y-car power cable unswitched		
f) Y-car I/O cable		
g) Airline tubing		
Check that the electronics tray is securely fastened to front end plate on both sides		
Check wiring and cables for any wear, cracks or loose connections		
Check all screw terminals to ensure that wiring is secure		
Check & Secure linear Thompson Rail & oil or grease rail as required		
Check & Secure gear rack		
Check & Secure all screws		

Y-Carriage Assembly	Comments	Signoff
Inspect Y motor drive belt (cracks, thread separation)		
Check that the electronics tray is securely fastened to front end plate on both sides		
Check wiring and cabls for any wear, cracks or loose connections		
Check all screw terminals to ensure that wiring is secure		
Check Y Motor disconnect plug		
Examine Solenoid Block		
a) Use manual trigger to fire each solenoid		
b) Check for air leaks		
Check & Secure all set screws		
a) Large Pulley		
b) Y Motor drive pulley		
c) Spur gear		
Inspect Thompson Linear bearings		
Adjust Y-motor assembly backlash		
Check & Secure all screws		
Check Y Home switch		
Check Y +ve and Y -ve limit switches		
Check amplifier connections		
Inspect electrical components for any damage and ensure they are securely fastened to the Y-car		

Tool Head Assembly	Comments	Signoff
Inspect theta motor drive belt (cracks, thread separation)		
Grease 16mm bearings(3) for air cylinders - Use Loctite High performance grease		
Inspect & oil knife lift bearing assembly		
Inspect & oil drill lift bearing assembly		
Test theta Home proximity sensor		
Secure theta Motor drive pulley set screws		
Examine cylinder motion - Fire cylinders manually via solenoid block		
Inspect the sharpening housing		
Inspect the knife intellicut system for any loose parts or wiring		
Inspect the drive belt for knife motor		

Rack & Rail Assembly	Comments	Signoff
Clean & oil THK rails		
Check Rack & Rail gap(s)		
Check Rack & Rail for wear		
Secure all screws		
b) Tighten #10-32 1/2" Rack button screws		
c) Tighten M3 Rail screws		
f) Tighten End stops screws		

Electrical Cabinet	Comments	Signoff
Clean fan filter on computer		
Use dry air to clean inside		
Tighten all screw terminals		
Secure all plugs and connections		
Check amplifiers and ensure mounting screws are secured		
Check wiring for 24V DC power supplies		
Check that the electronics drawer is securely fastened to front end plate on both sides		
Check wiring and cables for any wear, cracks or loose connections		
Check all screw terminals to ensure that wiring is secure		
Inspect & check transformers for discoloration and ensure that all screw terminal for wiring are tight and secure		
Inspect take-off I/O cable for proper secureness and damage		
Check take-off motor feedback cable		
Check take-off motor power cable		

Variable Frequency Drive (VFD)	Comments	Signoff
Check Main Power In		
Check Motor power		
VFD I/O cable		
Inspect and clean the VFD cooling fan		
Inspect blower motor interface and ensure terminal blocks are tight and secure		
Lock out / tag out all electrical powers before performing maintenance else it may result in serious injury or death		
Perform visual inspection of blower motor		
Perform visual inspection of filter, replace as required		
Inspect vacuum system piping and ensure all connections are secure		
Inspect for discoloration of pipes due to heat		
Vacuum out any loose debris		

Computer cables	Comments	Signoff
SynqNet out		
SynqNet In		
Network		
Video USB hub cable		
Video signal		
Computer power		
Monitor power		
Mouse		
keyboard		
UIT - Gantry		
UIT - computer		
Power over Ethernet power		

Additional Comments:

Maintenance Signature: Date:

Trouble Shooting Guides and Aides

UIT Error Messages

This has to be developed by software hence it is on hold as of now.

Additional Trouble Shooting

Any troubleshooting or maintenance performed on the machine should be done by a qualified technician. Before performing any work follow proper electric lockout procedures at your facility. All power to the machine should be off and proper care taken to prevent damage to the machine and/or injury.

WARNING

Failure to remove power and take proper safety precautions when performing maintenance and/or troubleshooting can result in injury or death. All work should be performed by a qualified technician.

The following trouble shooting covers machine problems that are not associated with software and/or does not generate an error message.

Problem: UIT Does Not Power Up

Description of Problem:

The UIT does not power. Screen is blank and not lit up.

Troubleshooting:

1. Touch the screen to see if it turns on. If the machine sits for a long period of time the touch screen goes i nto a sleep mode to protect the screen.
2. Check the power switch on the electronics drawer is in the on position.
3. Make sure that eSuite is running on the cutting machine PC.
4. Find the power over Ethernet injector (PoE) located behind the electronics drawer and check the green LED on the PoE injector. The LED on the front face is illuminated.
5. If there is no green LED lit, check the AC input on the PoE injector. If the AC power is gone then check back through the AC power cable. Also check the fuse F4 which is the 115 VAC fuse in electronics drawer that protects the PoE injector.

Problem: Machine Stop during Cut due to unintentional pause

Description of Problem:

The machine stops in middle of cut and displays message “Machine Paused, Press Zero, Next or Abort” on Touch Screen. When pressing NEXT on the keypad, the machine will continue to cut where it left off. This is typically caused by an intermittent pause circuit, usually in the stop discs.

Troubleshooting:

1. Move the stop discs to see if they are activated by a slight touch or vibration.

   a) Remove Operator side cover of gantry.

   b) Check the plunger by the pause switch on the Stop Discs. If the plunger is too loose, tighten it to prevent the pause switch from activating.

   c) Do the same check on the non-operator side.

Problem: The buttons on the Touch Screen are out of alignment

Description of Problem:

The buttons on the touch screen do not line up with the where the screen needs to be touched to activate the command. Operator needs to push above, below, right or left of the button for the command to take effect.

Troubleshooting:

The following procedure outlines the steps required to calibrate a touch screen on the Eastman Multi-ply gantry. If you notice buttons are not lined up while you are pressing them a Touch Screen calibration may be needed.

Procedure:

1. Power down the machine.
2. Place finger on upper left corner of the touch screen while power is turned off.

3. With finger is still on touch screen have a co-worker turn on machine power.

4. After the “Power On Setup” screen appears, remove your finger from the corner of touch screen.

5. After the Power On Setup screen appears, use the left and right arrows to navigate, and select to enter a sub-menu. Toggle to page 2 until you see the calibration screen, and select to enter the sub-menu. Toggle down until Touch Screen is highlighted and select it to activate it.

6. Using a very small screw driver, paperclip or a fine tip object, press the center of the cross that is located at the top left corner of the screen.

7. Follow the same procedure for the bottom right cross.

8. Navigate to page 3 and toggle down to Save and Exit and select it.

9. Your Touch Screen will restart in normal mode. It is ok to run the machineafter all proper startup procedures are followed.

Problem: The Cutting Tool does not come down

Description of Problem:

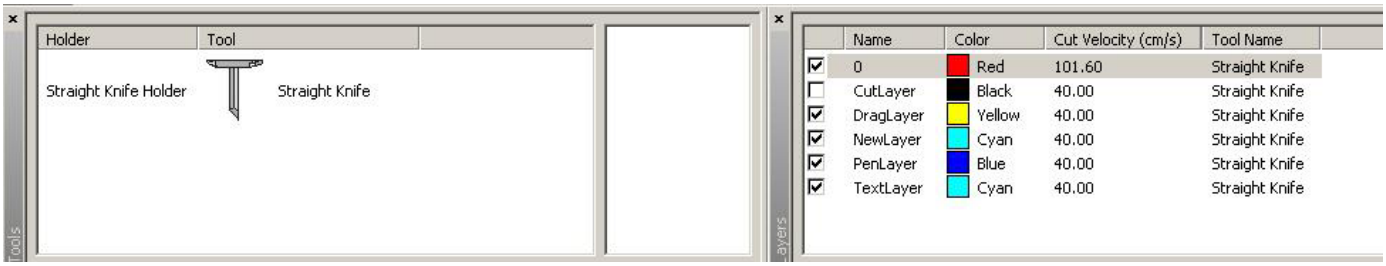
A tool does not come down when cutting a file or they are delayed coming down at the beginning of a cut. This can be caused by an electrical short, tool mapping in software or a problem with the power supply.

Troubleshooting:

1. Make sure that Tool power on gantry is turned on. This can be verified by making sure the laser pointer is on.

2. Check the mapping of your tools and the layers are mapped properly under each tool.

   a) The quick way to verify tool and layer mapping is to look at the tool bar at the bottom of the eCut window. If there is no Tool Bar then click on “View” then click on “Layers” and “Tools” in the main eSuite menu.



3. With eSuite closed, check tool holder to see if it moves freely and is not bent.

4. Check the tool connections on the Y-car slice I/O board.

a) Hit the Cut Down button on the UIT and verify the corresponding LED lights for desired tool.

b) Try firing the tool manually by pressing gently with the end of a small paper clip into the small hole at the top front of desired air valve. Each solenoid can be manually fired by pressing the individual button.

c) Make sure all yellow wires are securely attached to the Y-car slice output card. If any wires are loose refer to schematic for proper location otherwise call Eastman technical support.

5. The Tool delays coming down and misses beginning of marking or cut.

a) Check the voltage on the 24V DC power supply. Make sure it is a minimum of 24V DC.

b) Check solenoid connectors at Y-car slice I/O Board. Make sure you have a good connection.

c) Try cycling a different air valve. If the other air valves are working properly the bad air valve should be replaced.

Problem: Gantry goes past limit and hits End Stops

Description of Problem:

While cutting certain files, the conveyor begins to pull and gantry runs to end of table and hits end stops.

Troubleshooting:

1. Check the table limits to make sure that each tool can reach to the laser position without hitting a table limit.

a) Click on “eCut” then click on “Check Reference” in the main eSuite menu

b) After the table finishes zeroing, press “Yes” on the check table limits pop up box

c) On the Touch Screen Keypad press the “Y” then the “ENTER” key (ENTER key on keyboard)

d) The table will check the table limits to make sure each tool can reach within the set limits.

e) If the Y-car or Gantry hit a limit switch, reset the table limits in eSuite by clicking on eCut then “Machine Settings” and finally the “Size” tab. Adjust “Table Top”, “Table Bottom”, Table Right” or “Table Left” limits as required.

RF/EMI Interference

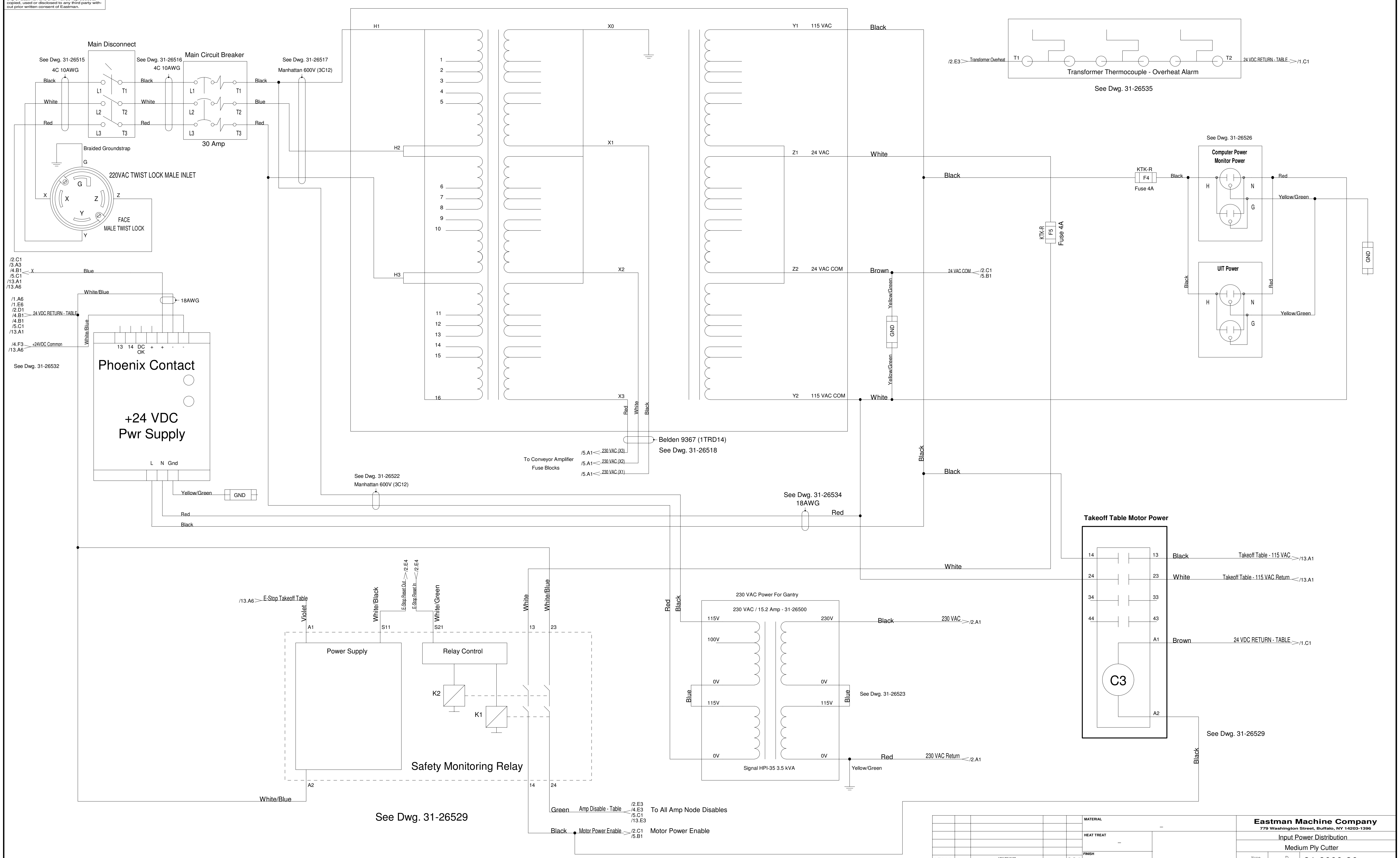
Some factory environments may have equipment that generates Radio Frequency (RF) or Electro-Magnetic Interference (EMI). These signals in close proximity to the Eastman Multi-Ply cutter can generate electrical noise and cause problems for the machine and computer. (Eastman does offer a shielded mouse.) It is recommended that any RF Welders or other equipment generating RF or EMI noise be a minimum of 75 feet (23 meter) from the cutter.

Problems of this nature are typically difficult to resolve and must be approached in a systematic manner. To reduce the effects of electrical noise generated by RF, Eastman Machine Company has the following recommendations:

- Install an earth ground as close as possible to the transformer feeding AC power to the cutting machine and power feed unit.
- Enclose all AC power cables in rigid conduit and ground securely to the earth ground, Route the four power cables for the computer controls around the end of the cutter instead of under the unit, and
- Implementation of the foregoing should at least reduce the level of interference to a workable level but in the event that it does not, you should be prepared to provide RF and/or install power line filters as needed.

Electrical Schematics & Pneumatic Diagrams

The following electrical and pneumatic drawings are for reference only. Eastman maintains the right to change electrical and pneumatic specifications without notice. Any modifications to machine wiring without written permission from Eastman Machine Company shall void all warranties.



Main Disconnect
See Dwg. 31-26515
4C 10AWG
Black
White
Red
L1 T1
L2 T2
L3 T3
See Dwg. 31-26516
4C 10AWG
Main Circuit Breaker
30 Amp
See Dwg. 31-26517
Manhattan 600V (3C12)
Blue
Braided Groundstrap
G
220VAC TWIST LOCK MALE INLET
X
Y
Z
FACE
MALE TWIST LOCK
H1
H2
H3
X0
X1
X2
X3
Y1 115 VAC
Z1 24 VAC
Z2 24 VAC COM
Y2 115 VAC COM
Brown
Yellow/Green
GND
24 VAC COM /2.C1 /5.B1
/2.E3 Transformer Overheat
T1
T2
24 VDC RETURN - TABLE /1.C1
Transformer Thermocouple - Overheat Alarm
See Dwg. 31-26535
See Dwg. 31-26526
Computer Power Monitor Power
UIT Power
H N G
KTK-R F4 Fuse 4A
KTK-R F5 Fuse 4A
/2.C1 /3.A3 /4.B1 /5.C1 /13.A1 /13.A6 X
White/Blue
18AWG
/1.A6 /1.E6 /2.D1 /4.B1 /4.B1 /5.C1 /13.A1 24 VDC RETURN - TABLE
/4.F3 /13.A6 +24VDC Common
See Dwg. 31-26532
13 14 DC OK + + - -
Phoenix Contact
+24 VDC
Pwr Supply
L N Gnd
Belden 9367 (1TRD14)
See Dwg. 31-26518
To Conveyor Amplifier Fuse Blocks
/5.A1 230 VAC (X3)
/5.A1 230 VAC (X2)
/5.A1 230 VAC (X1)
See Dwg. 31-26522
Manhattan 600V (3C12)
See Dwg. 31-26534
18AWG
Takeoff Table Motor Power
14 13 Takeoff Table - 115 VAC /13.A1
24 23 Takeoff Table - 115 VAC Return /13.A1
34 33
44 43
A1 24 VDC RETURN - TABLE /1.C1
C3
A2
See Dwg. 31-26529
/13.A6 E-Stop Takeoff Table
Violet
White/Black
E-Stop Reset Out /2.E4
E-Stop Reset In /2.E4
White/Green
A1 S11 S21 13 23
Power Supply
Relay Control
K2
K1
Safety Monitoring Relay
A2 14 24
230 VAC Power For Gantry
230 VAC / 15.2 Amp - 31-26500
115V 230V 100V 0V 115V 0V
230 VAC /2.A1
See Dwg. 31-26523
Signal HPI-35 3.5 kVA
230 VAC Return /2.A1
Green Amp Disable - Table /2.E3 /4.E3 /5.C1 /13.E3 To All Amp Node Disables
Black Motor Power Enable /2.C1 /5.B1 Motor Power Enable

ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

MATERIAL: –
HEAT TREAT: –
FINISH: –
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

Input Power Distribution
Medium Ply Cutter

SCALE: None | SIZE: D | DRAWN BY: SGJ | DATE: 6/19/07

31-9000-36

From Transformer HPI-35

/1.E5 230 VAC — Black — See Dwg. 31-26523

/1.F5 230 VAC Return — Red

Black

Red

See Dwg. 31-26524

Red — 14 — 13

Black — 24 — 23

34 — 33

44 — 43

A1

C1

A2

Gantry Motor Pwr

/1.F3 Motor Power Enable — Black — See Dwg. 31-26529

/1.B5 24 VAC COM — Brown

See Dwg. 31-26531

Black — L1

Fuse 15A — F1 — RKQ-R

GND

Red — L2

Line — 230VAC Line Filter 31-26501 — Load

L1' — Black

GND

L2' — Red

Yellow/Green

GND

See Dwg. 31-26531

See Dwg. 31-26531

Under Table

Gantry Power Cable

Non-Op Side (Gantry)

Black	T1	1	T1	Black	230 VAC LF - X	/6.A1 /7.A1
Red	T2	2	T2	Red	230 VAC Return LF - X	/6.A1 /7.A1
				See Dwg. 31-26546-MS		
Yellow/Green	GND	Yellow/Green	GND	Yellow/Green	GND LF	/6.A1 /7.A1 /8.A1
Black	T3	3	T3	Black	230 VAC LF - Y	/8.A1
Red	T4	4	T4	Red	230 VAC Return LF - Y	/8.A1
				See Dwg. 31-26549-MS		
Black	Fuse 4 Amp F3	Black	T5	5	T5	Black	230 VAC UNSWITCHED	/6.B2 /8.B2
Red		Red	T6	6	T6	Red	230VAC UNSWITCHED RETURN	/6.B2 /8.B2

See Dwg. 31-26524

/1.B1 X — Blue

/3.A3 — White/Blue

See Dwg. 31-26532

/1.C1 24 VDC RETURN - TABLE

/12.F2 SynqNet To Computer

/5.A4 SynqNet From Conveyor Amp

See Dwg. 31-26532r

IN — IN

OUT — OUT

0 — 1 — 24 VDC RETURN

+24 VDC

2 — 3

GND

4 — 5

FIELD PWR RETURN

6 — 7

FIELD POWER

White/Blue

Blue

TSIO-1001
NETWORK ADAPTER

TSIO - 2008
DIGITAL INPUT

0 — 1	CH1	Yellow	Next	/4.B1
	CH0	Green	See Dwg. 31-26529 Amp Disable - Table	/1.F3
2 — 3	CH3	Orange	Belt Jog	/4.C1
	CH2	White	Pause	/4.B1
4 — 5	CH5	Red (Black)	Transformer Overheat	/1.A5
	CH4	Brown	Take Off Jog	/13.A6
6 — 7	CH7			
	CH6			

TSIO - 5001
RELAY OUTPUT

0 — 1	CH1	Black (Red)		
	CH0	Black/white	F-Stop Reset Out	/1.E2
2 — 3	CH1	Red (Black)		
	CH0	Green/White	F-Stop Reset In	/1.E2
4 — 5	L1			
	L1			
6 — 7	L2			
	L2			

See Dwg. 31-26529

TSIO - 7002
ANALOG OUTPUT

0 — 1	CH 2 +		
	CH 1 +	Black (White)	
2 — 3			
4 — 5	CH 2 -		
	CH 1 -	White (Black)	
6 — 7	SHLD		
	SHLD	Shield	

See Dwg. 31-26540

Black (Red) — STF

Red (Black) — AU

Brown (Jmpr) — SD

Black (White) — 4 (+)

White (Black) — 5 (-)

Mistubishi F700 VFD

IO Panel

Table I/O

ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

MATERIAL: –

HEAT TREAT: –

FINISH: –

DO NOT SCALE DRAWING

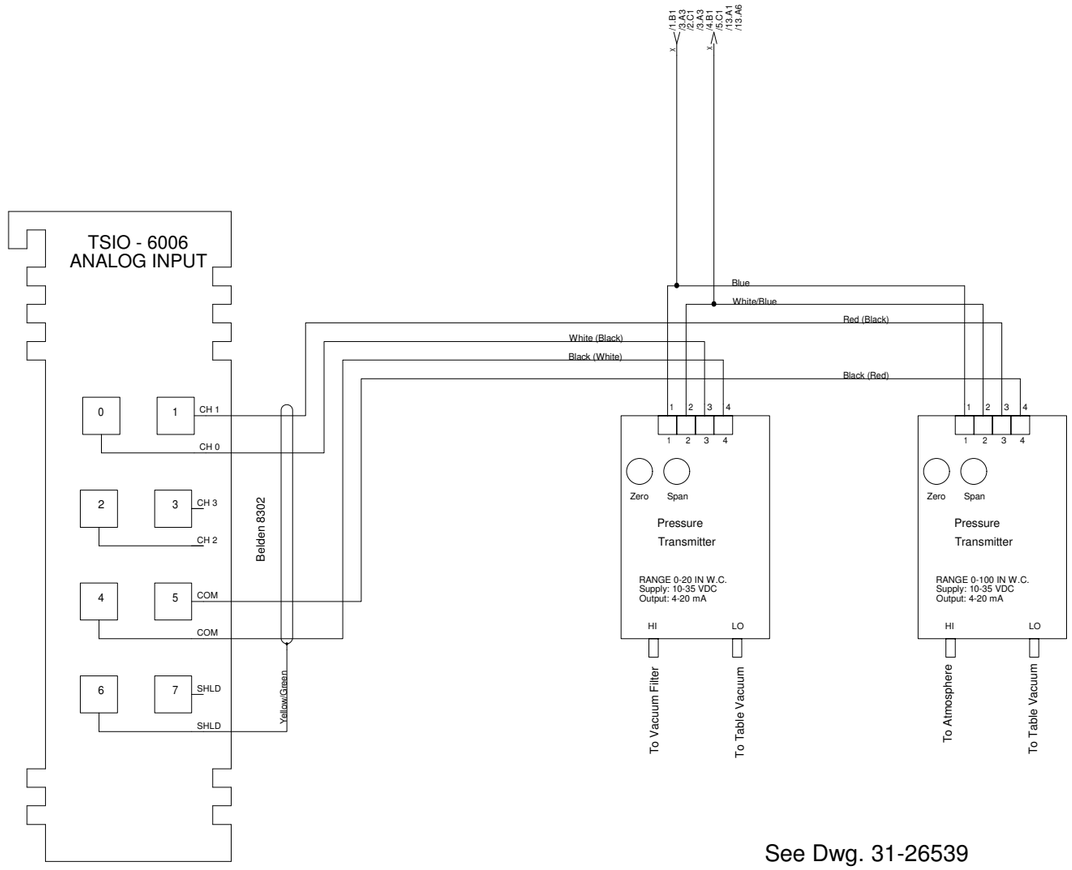
Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

Table I/O #1

Medium Ply Cutter

SCALE: None — SIZE: D — DRAWN BY: SGJ — DATE: 6/19/07

31-9000-36



See Dwg. 31-26539

ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

MATERIAL –
HEAT TREAT –
FINISH –
DO NOT SCALE DRAWING

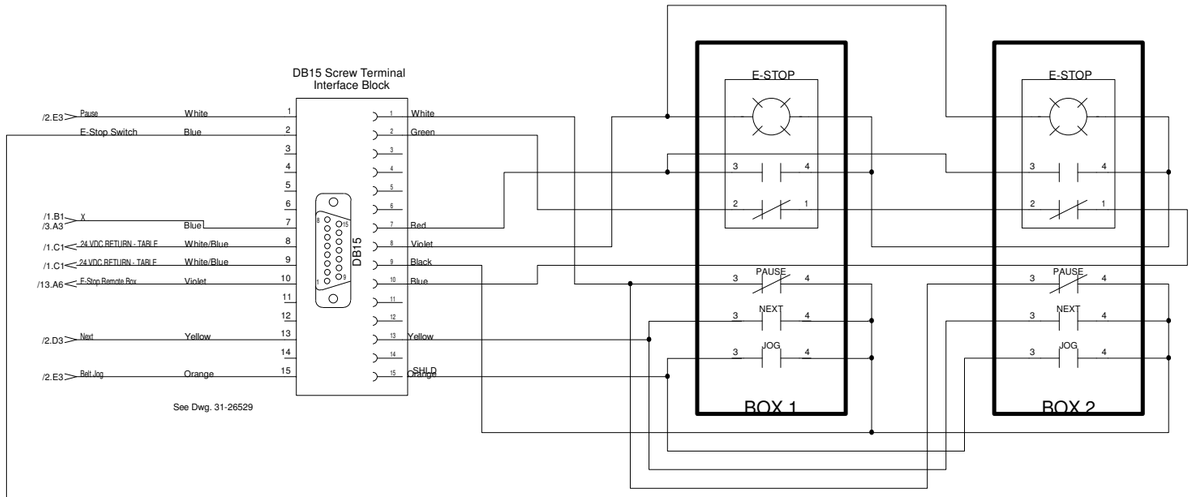
Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

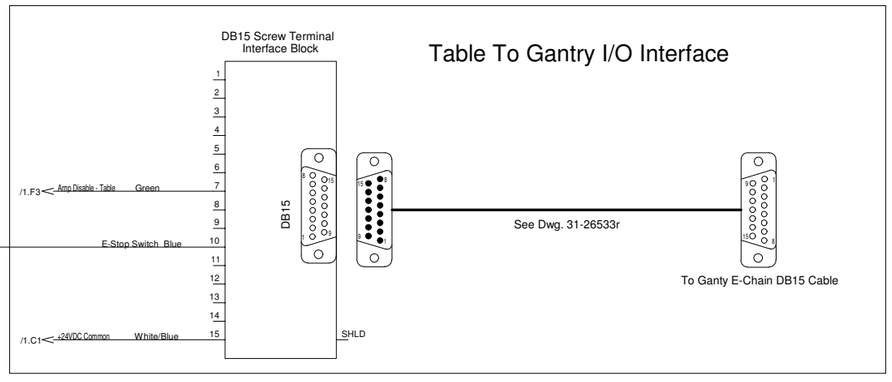
Table I/O #1
Medium Ply Cutter

SCALE None | SIZE D | DRAWN BY SGJ | DATE 6/17/07

31-9000-36

Table Remote E-Stop Boxes





					MATERIAL: –	Eastman Machine Company 779 Washington Street, Buffalo, NY 14203-1396	
					HEAT TREAT: –	Table Remote E-Stop Boxes	
					FINISH: –	Medium Ply Cutter	
15398		NEW RELEASE	11/11/07	SGJ	DO NOT SCALE DRAWING	SCALE: None / DRAWN BY: SGJ	SIZE: D / DATE: 6/17/07
ECN	REV	CHANGES	DATE	BY		31-9000-36	4 of 13

See Dwg. 31-26519

3 Phase Circuit Breaker

/1.D3 230 VAC (X1) Black — L1 — T1 — Black — 14 — 13
/1.D3 230 VAC (X2) White — L2 — T2 — White — 24 — 23
/1.D3 230 VAC (X3) Red — L3 — T3 — Red — 34 — 33
12 Amp
CB2
44 — 43

Belden 9367 (1TRD14)
See Dwg. 31-26518

Belden 9367 (1TRD14)
See Dwg. 31-26520

Black — A
White — B
Red — C
N
G

Line Filter
Line — Load
31-26299

A' Black
B' White
C' Red
N'
G'

Belden 9367 (1TRD14)
See Dwg. 31-26521

SynqNet From Takeoff Amp /13.B2
SynqNet From Conveyor Amp /2.D1
See Dwg. 31-26532r

A1
C2
A2
Conveyor Motor Pwr

See Dwg. 31-26538

Conveyor Amp
1 31-26389
2

/1.B5 24 VAC COM — Brown
/1.F3 Motor Power Enable — Black
See Dwg. 31-26529
/1.F3 Amp Disable - Table — Green

White/Blue — +24 Return
Blue — +24VDC
IO5
Mini D 36 Pin Female

SynqNet In
SynqNet Out

AC 3 Black
AC 2 White
AC 1 Red

F5
Mini D 20 Pin Female

Motor T
Motor S
Motor R
SMC9930-100-000-1B-1

/1.B1 X — Blue
/3.A3 — White/Blue
/1.C1 24 VDC RETURN - TABLE

M5

Conveyor Motor Power Connector
D A C B
31-00986

M6
Motor Power Cable

See Dwg. 31-26538r

M6
Mtr Pwr
IP20
M
Feedback
IP20
F6
Motor Feedback Cable
Conveyor Motor

Conveyor Feedback Connector
N A B C P M L K T J H D R E F S G
31-00987

F5
F6

Custom I/O Block

STC4

IO5

J1
Plug 1 Pin1 — 1 — Positive Limit
Plug 1 Pin 2 — 2 — Negative Limit
Plug 1 Pin 3 — 3 — Node Disable
Plug 1 Pin 4 — 4 — Home
Plug 1 Pin 5 — 5 — Opto_In_Com
Plug 1 Pin 6 — 6 — +5 VDC
Plug 1 Pin 7 — 7 — Common

J2
Plug 2 Pin 3 — 8 — Node Disable
Plug 2 Pin 4 — 9 — Home
Plug 2 Pin 5 — 10 — Opto_In_Com

J3
Plug 3 Pin 3 — 11 — Node Disable
Plug 3 Pin 4 — 12 — Home
Plug 3 Pin 5 — 13 — Opto_In_Com

All 3 Plug HSG's — 14 — Shield
All 3 Plug HSG's — 15 — Shield
GND

ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

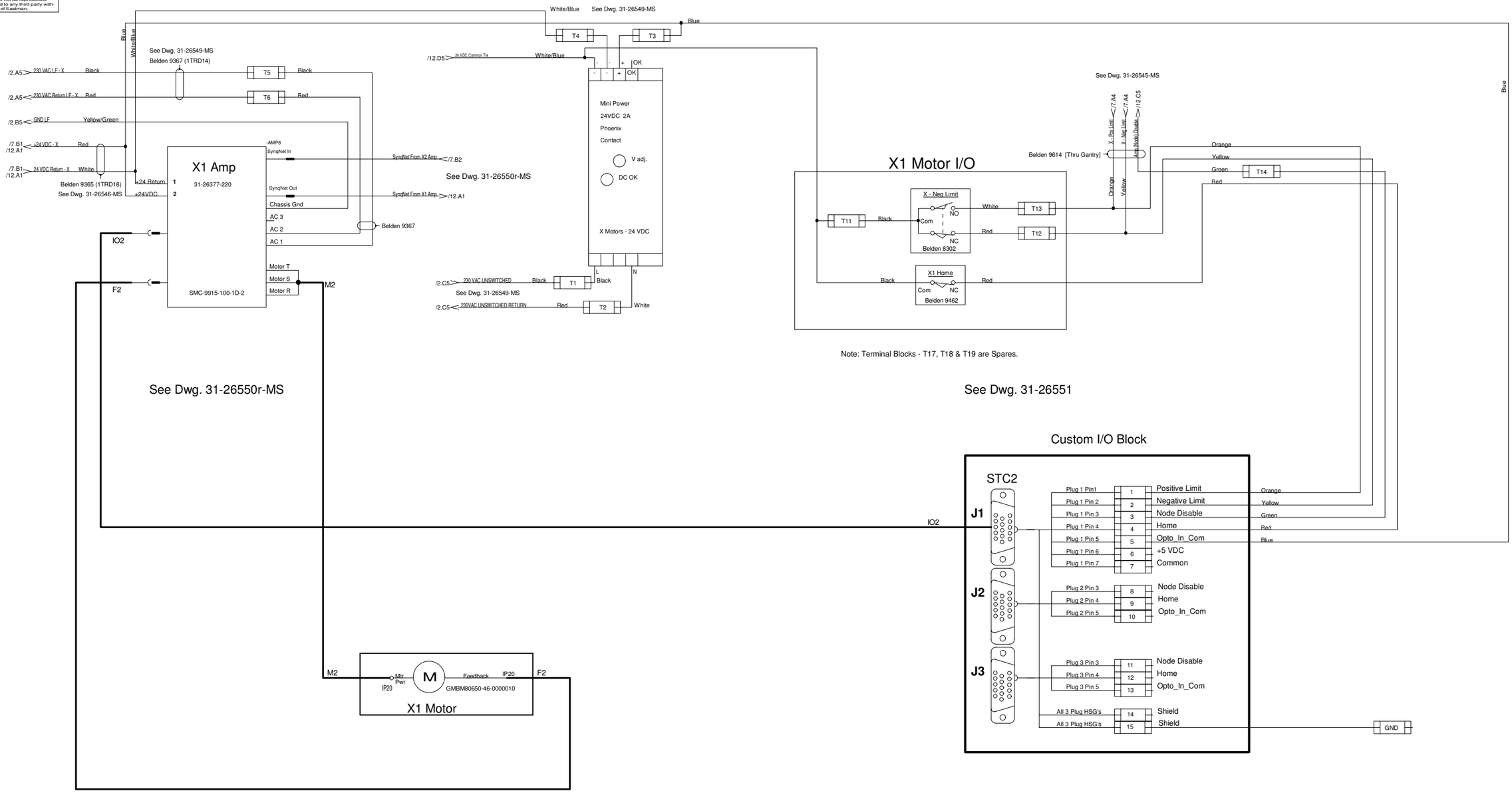
MATERIAL: --
HEAT TREAT: --
FINISH: --
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

Conveyor Motor
Medium Ply Cutter

SCALE: None | SIZE: D
DRAWN BY: SGJ | DATE: 6/17/07

31-9000-36



ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

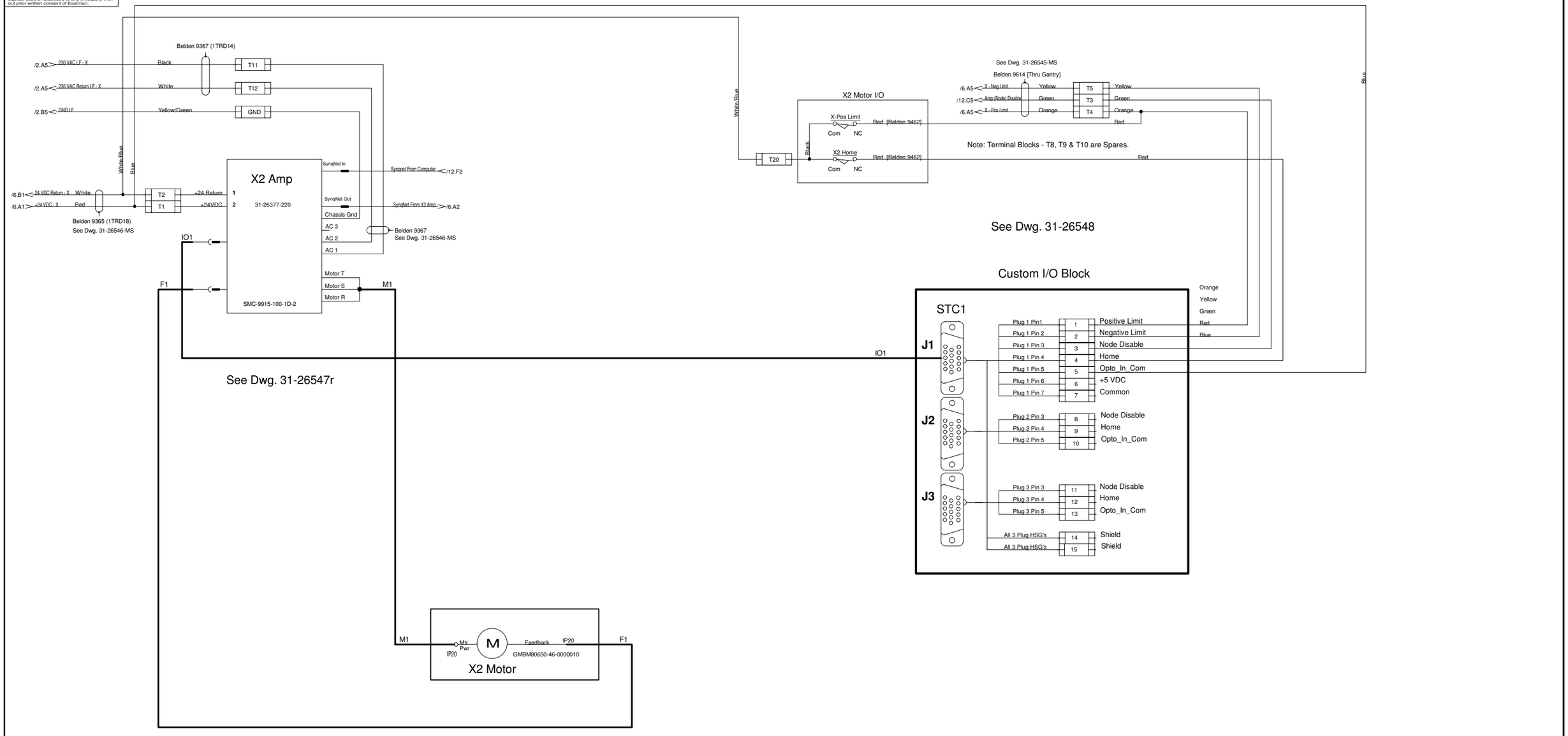
MATERIAL: --
HEAT TREAT: --
FINISH: --
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

X1 Motor
Medium Ply Cutter

SCALE: None | SIZE: D | DRAWN BY: SGJ | DATE: 6/17/07

31-9000-36



ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

MATERIAL: –
HEAT TREAT: –
FINISH: –
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

X2 Motor
Medium Ply Cutter

SCALE: None | SIZE: D | DRAWN BY: SGJ | DATE: 6/17/07

31-9000-36

/2.B5 230 VAC LF - Y — Black
/2.B5 230 VAC Return LF - Y — White
/2.B5 GND LF — Yellow/Green
Belden 9367
See Dwg. 31-26553-MS

GND

Glentek Power Supply GP8600-50-2

AC In 1
AC In 2
AC In 3
Chassis GND
Fan Pwr In
Fan Pwr In

B+ 1 Red
B- 1 Black
B+ 2 Red
B- 2 Black
B+ 3 Red
B- 3 Black
B+ 4
B- 4

THETA MOTOR B+ >/9.A1
THETA MOTOR B- </9.A1
KNIFE MOTOR B+ >/10.A1
KNIFE MOTOR B- </10.A1

See Dwg. 31-26556

Fan Pwr Out
Fan Pwr Out

L — 230 VAC Fan
N

Blue — +24 VDC - Y-Car >/9.B1 /10.B1 /11.A1
White/Blue — 24 Return - Y-Car >/9.B1 /10.B1 /11.A1
Blue
White/Blue — 3 (Igus Cable) — 24 VDC Common Tie >/12.D5
See Dwg. 31-26555-MS

13 14 OK + + - -

Phoenix Contact

+24 VDC
Pwr Supply

L N Gnd

/9.A3 SynqNet From Theta Amp
/10.A3 SynqNet From Y Amp

Y Motor
Gantry Amplifier
31-26359-320
SMC-9915-100-00-2

SynqNet In
SynqNet Out
B-
B+
Motor T Blue
Motor S White
Motor R Red

White/Blue +24 Return 1
Blue +24VDC 2

IO4 Control I/O
F4 Encoder/Halls

M4

See Dwg. 31-26556

/2.C5 230 VAC UNSWITCHED — T15 — 1
/2.C5 230VAC UNSWITCHED RETURN — T16 — 2
L N Gnd

Non-Op Side (Gantry)
Igus Chainflex
(4th wire is 24VDC Common Tie)
See Dwg. 31-26554-MS
GND

T32 Black (Red)

Y Motor I/O

Y Pos Limit
Black (Red) — White
Com — Norm Closed

Y Neg Limit
Black (Red) — Black (White)
Com — Norm Closed

Y Home
Black (Red) — Red
Com — Norm Closed

Use Belden 8302 2PR22

/12.C5 Amp (Node) Disable
See Dwg. 31-26555-MS
T27 White/Green T25

See Dwg. 31-26558

Blue

See Dwg. 31-26557r-MS

See Dwg. 31-26559r-MS IO4

Y-Car
Custom I/O Block

STC3

J1 Y
Plug 1 Pin1 — 1 — Positive Limit — White
Plug 1 Pin 2 — 2 — Negative Limit — Black (White)
Plug 1 Pin 3 — 3 — Node Disable — Green
Plug 1 Pin 4 — 4 — Home — Red
Plug 1 Pin 5 — 5 — Opto_In_Com — Blue
Plug 1 Pin 6 — 6 — +5 VDC — Red
Plug 1 Pin 7 — 7 — Common — Black

J2 T
Plug 2 Pin 3 — 8 — Node Disable
Plug 2 Pin 4 — 9 — Home
Plug 2 Pin 5 — 10 — Opto_In_Com

J3 K
Plug 3 Pin 3 — 11 — Node Disable
Plug 3 Pin 4 — 12 — Home
Plug 3 Pin 5 — 13 — Opto_In_Com

All 3 Plug HSG's — 14 — Shield
All 3 Plug HSG's — 15 — Shield

See Dwg. 31-26558

Laser Pointer
Belden 9462
Red +5VDC — Black COM

M4 — Mtr Pwr IP20 — M — Feedback IP20 — F4
GMBM60400-29-0000010
Y Motor

15398		NEW RELEASE	11/11/07	SGJ	
ECN	REV	CHANGES	DATE	BY	

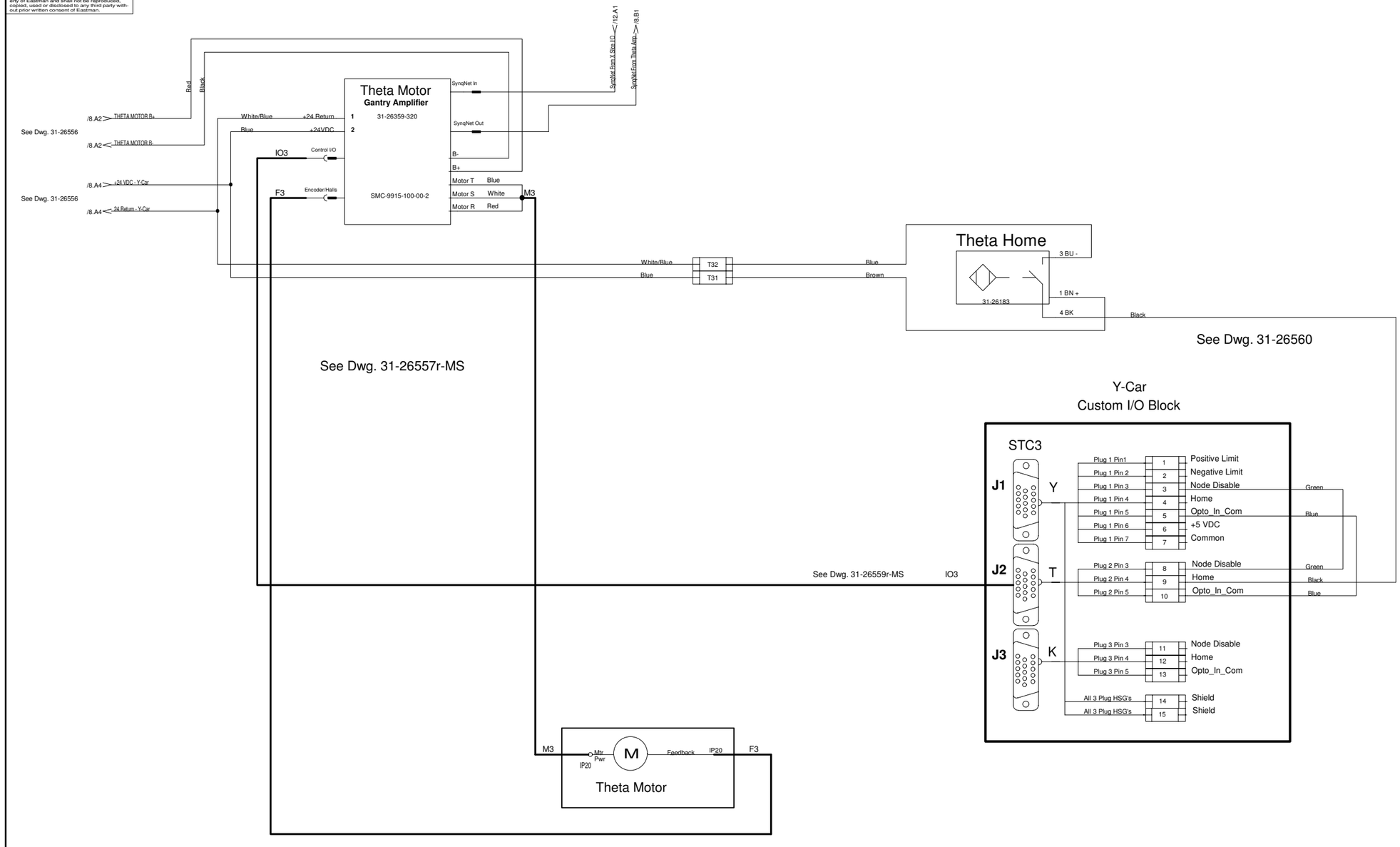
MATERIAL –
HEAT TREAT –
FINISH –
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

Y Motor
Medium Ply Cutter

SCALE None | SIZE D
DRAWN BY SGJ | DATE 6/17/07

31-9000-36



ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

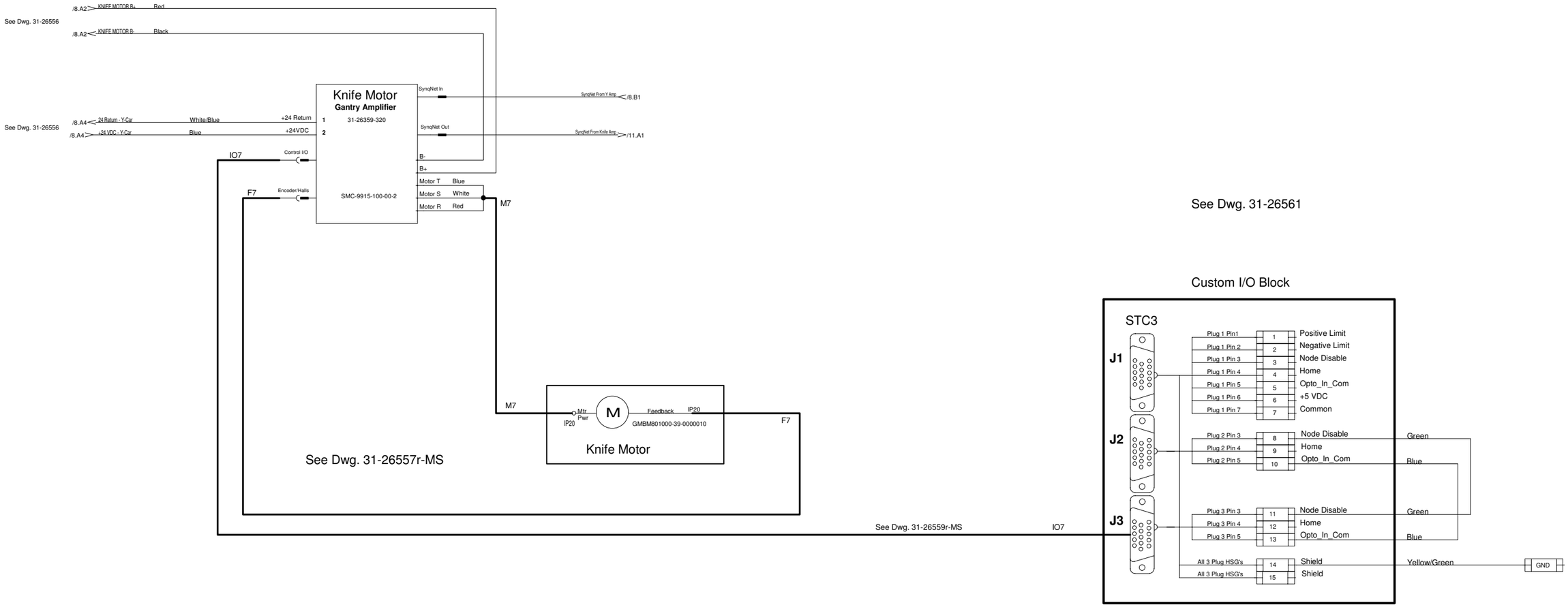
MATERIAL –
HEAT TREAT –
FINISH –
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

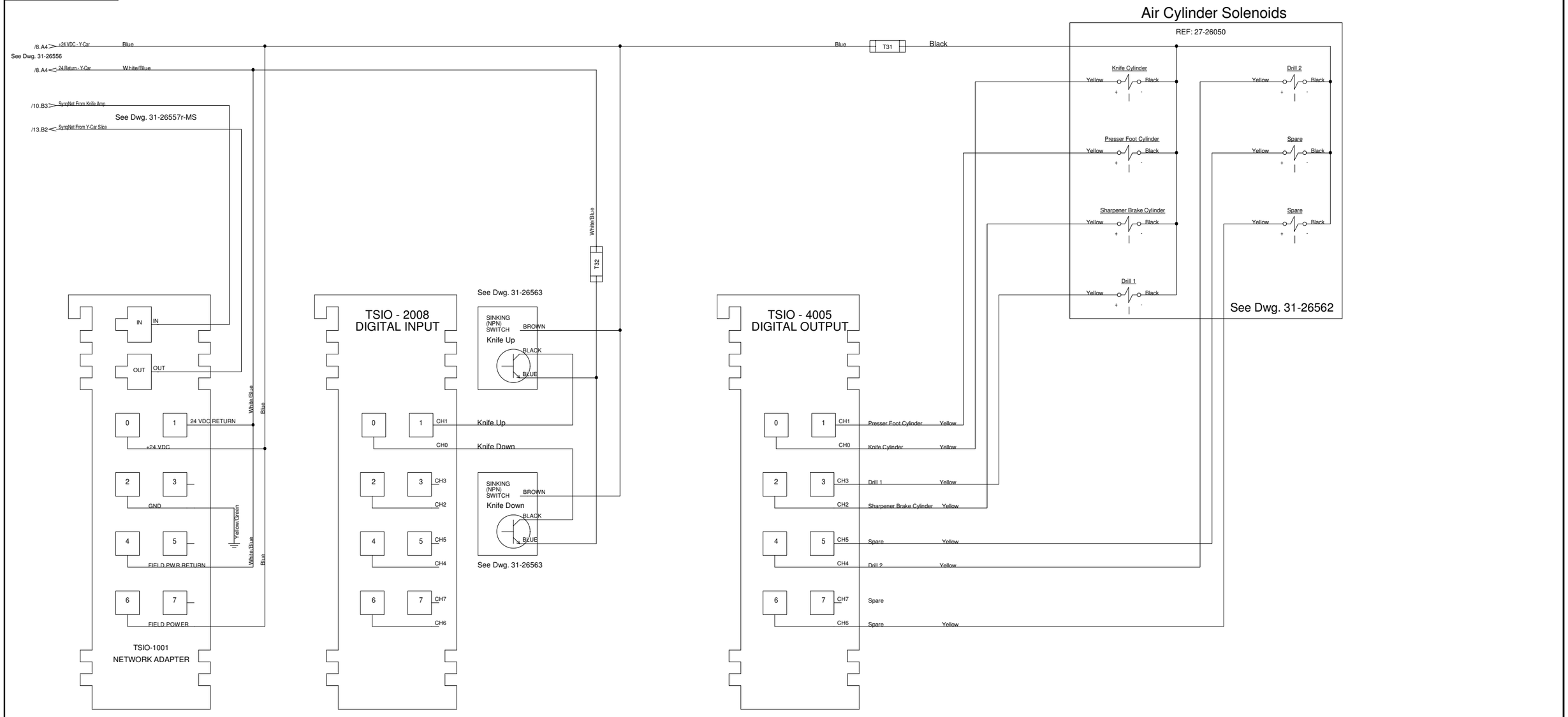
Theta Motor
Medium Ply Cutter

SCALE None | SIZE D | DRAWN BY SGJ | DATE 6/17/07

31-9000-36



					MATERIAL –	Eastman Machine Company 779 Washington Street, Buffalo, NY 14203-1396
					HEAT TREAT –	Knife Motor
					FINISH –	Medium Ply Cutter
15398		NEW RELEASE	11/11/07	SGJ	DO NOT SCALE DRAWING	SCALE None SIZE D DRAWN BY SGJ DATE 6/17/07 31-9000-36
ECN	REV	CHANGES	DATE	BY		10 of 13



Y-Car I/O

ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

MATERIAL: –
HEAT TREAT: –
FINISH: –
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

Y-Car I/O
Medium Ply Cutter

SCALE: None | SIZE: D | DRAWN BY: SGJ | DATE: 6/17/07

31-9000-36

/6.A1 +24 VDC - X — Red — T3 — Blue
/6.B1 -24 VDC Return - X — White — T4
Belden 9365 (1TRD18)
See Dwg. 31-26546-MS
/6.B2 SynqNet From X1 Amp — See Dwg. 31-26550r-MS
/9.A3 SynqNet From X Slice I/O — See Dwg. 31-26557r-MS

IN
OUT
0 1 24 VDC RETURN
+24 VDC
2 3
GND
4 5
FIELD PWR RETURN
6 7 FIELD POWER
TSIO-1001
NETWORK ADAPTER

TSIO - 2008
DIGITAL INPUT
0 1 CH1 Joystick Up (Pos Y) Red (black)
CH0 Joystick Dn (Neg Y) Black (red)
2 3 CH3 Joystick Lft (Neg X) White (black)
CH2 Joystick Rt (Pos X) Black (white)
Belden 8302
4 5 CH5 Tool Enable Red (Belden 9462)
CH4 Pause White (Belden 9462)
6 7 CH7
CH6

Joystick
UP U1 U2
DOWN D1 D2
LEFT L1 L2
RIGHT R1 R2

T8 T7
White/Blue
Blue

Tool Enable Sw.
OFF ON S1 S2
Red Black
1 GRN 2 Tools
White/Blue

Pause PB
Pause Disk
See Dwg. 31-26565
Black
White
Violet
1 YEL 2 Pause IL - Op Side
Brown
See Dwg. 31-26545-MS
T15
Operator Side Pause Circuit

White/Blue
Brown
Blue
Non-Op Side
T6 T7
See Dwg. 31-26545-MS
Pause Disk
Pause PB
See Dwg. 31-26565
1 YEL 2 Pause IL - Non-Op Side
Violet
Non-OP Side Pause Circuit

Blue
1 2 3 4 E-Stop PB
Blu/Wht
1 RED 2 E-Stop Non-Op Side
Non-Op Side E-Stop
White/Blue
Blue
T20

DB15 Screw Terminal
Interface Block
DB15 Socket Connector
-39 *15/15
-37 *15/15
DB15 Pin Connector
DB15
/6.A5 /7.A4 /8.A5 Amp (Node) Disable — T3 — Green — Amp (Node) Disable
Blue — E-Stop Switch
/6.A2 /8.A4 24 VDC Common Tie — T20
SHLD
See Dwg. 31-26566r
See Dwg. 31-26533r
E-Chain Cable
Non-Op Side

DB15 Socket Connector
*15/15
-38
Under Table

Blue
1 2 3 4 E-Stop PB
Blu/Wht
1 RED 2 E-Stop Op-Side
Blue
See Dwg. 31-26545-MS
T16
White/Blue
Oper Side E-Stop

QSI Touchscreen
Ethernet
1 TX- 2 TX+ 3 RX+ 4 COM 5 6 7 8 9 RX- DB9-F

INJECTOR
POWER OVER ETHERNET
POWER + DATA
DATA

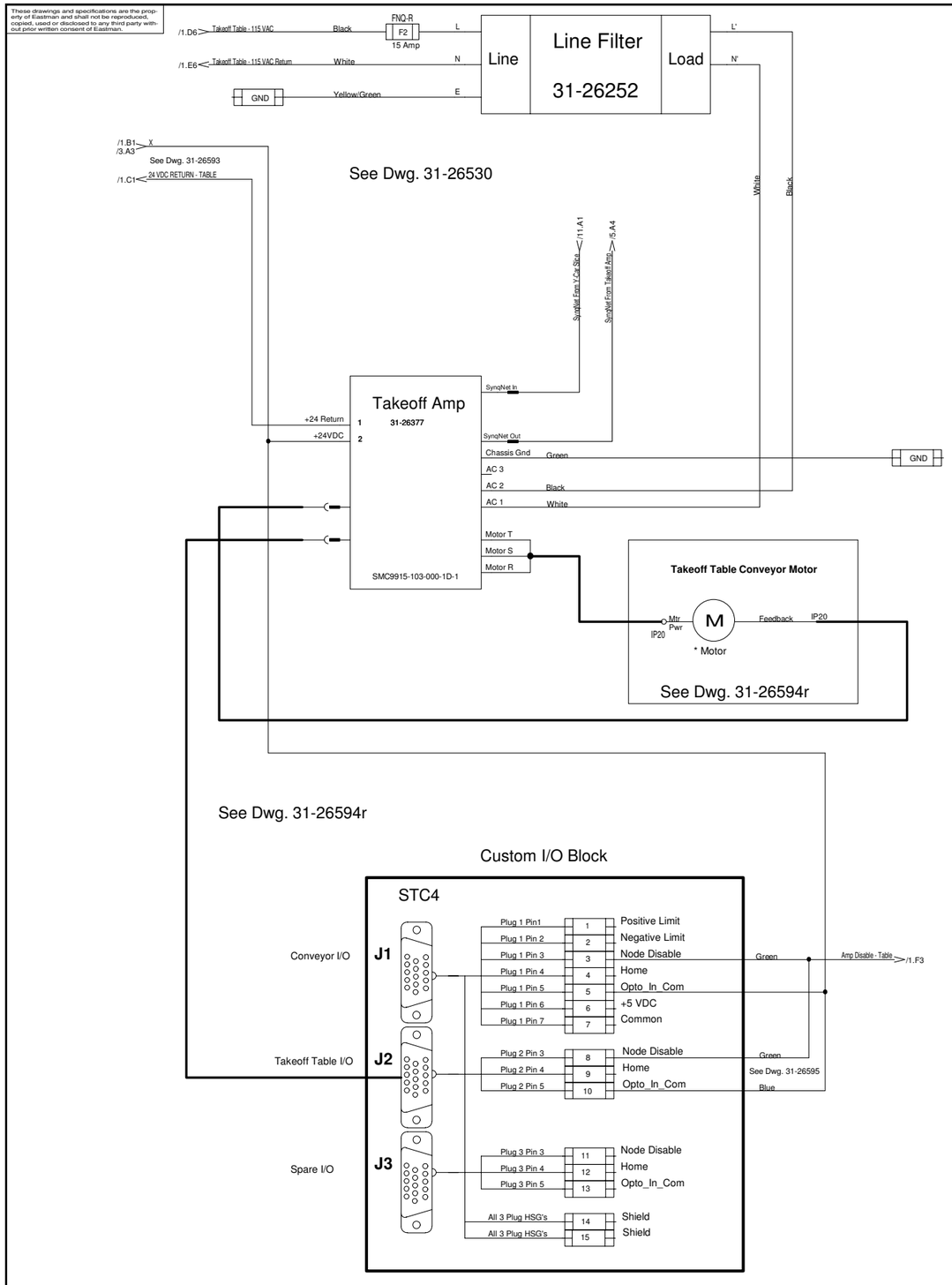
/2.D1 Synqnet To Computer — See Dwg. 31-26532r — SynqNet In
/7.B2 Synqnet From Computer — SynqNet Out
SynqNet Controller Card
Ethernet Ports
Touchscreen
Network
Computer

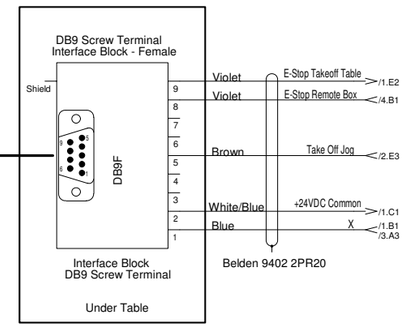
For Wiring Details See Dwg. 31-26564

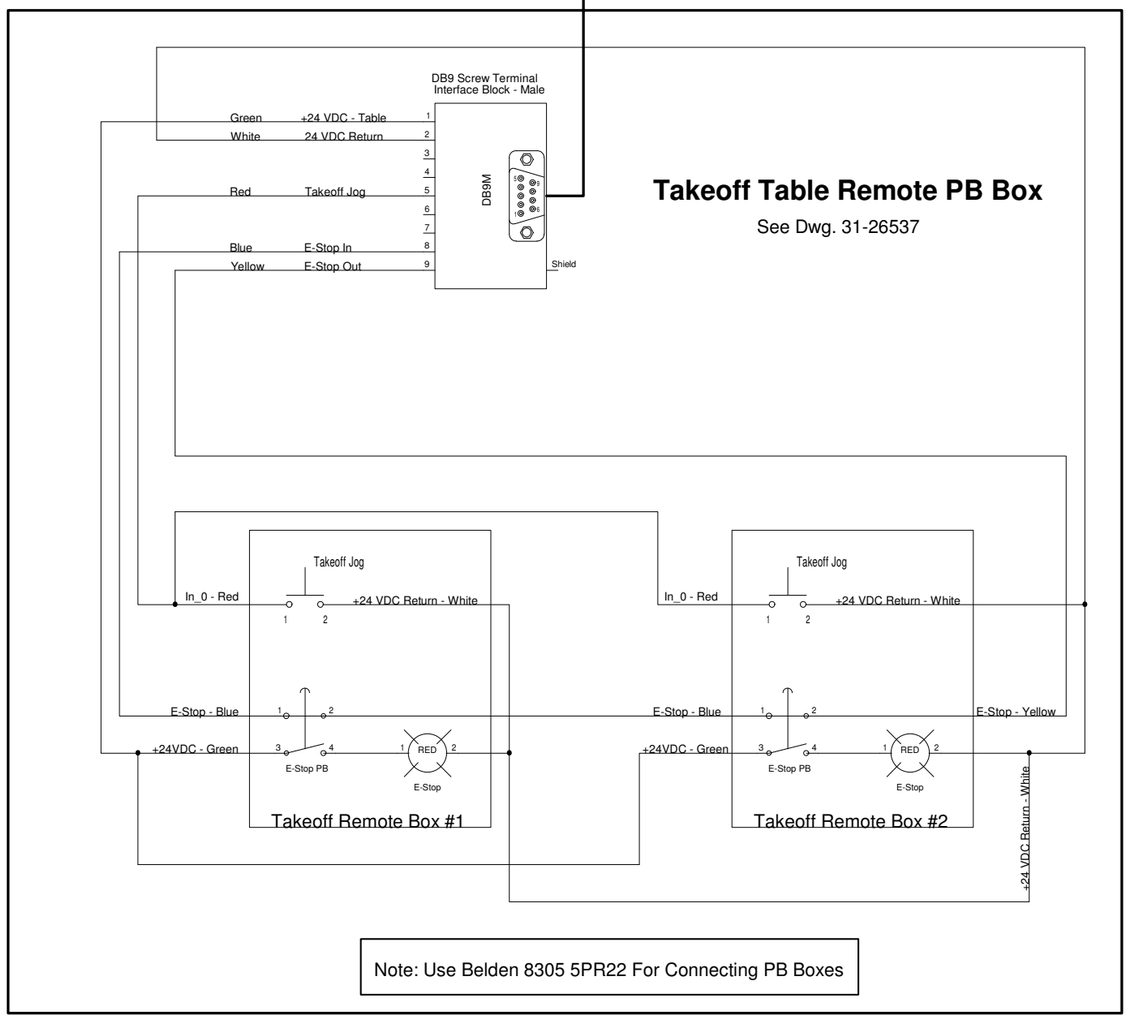
ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

MATERIAL –
HEAT TREAT –
FINISH –
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396
X Axis I/O
Medium Ply Cutter
SCALE None | SIZE D
DRAWN BY SGJ | DATE 6/17/07
31-9000-36







ECN	REV	CHANGES	DATE	BY
15398		NEW RELEASE	11/11/07	SGJ

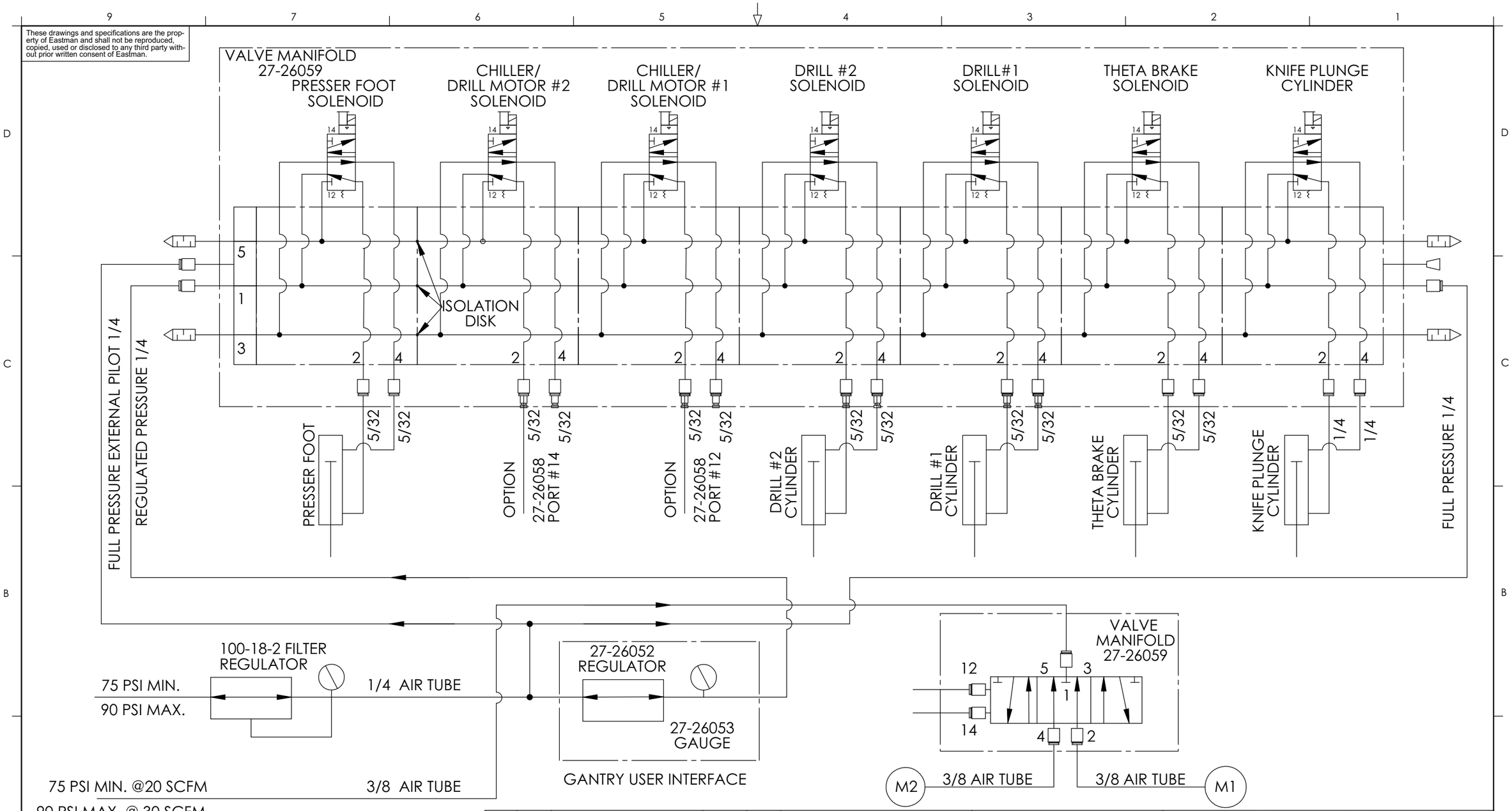
MATERIAL: --
HEAT TREAT: --
FINISH: --
DO NOT SCALE DRAWING

Eastman Machine Company
779 Washington Street, Buffalo, NY 14203-1396

Takeoff Table
Medium Ply Cutter

SCALE: None | SIZE: D | DRAWN BY: SGJ | DATE: 6/17/07

31-9000-36



ECN	REV	CHANGES	DATE	BY
16154	-	NEW RELEASE	09/10/08	JWR

MATERIAL -

DIMENSIONS ARE IN INCHES
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.XX ± .01 FRACTIONAL: ± 1/64
.XXX ± .005 ANGULAR: ± 1°
SURFACE FINISH PER ANSI 846.1 125 RMS
SURFACE PROFILE ( ) .01
BREAK SHARP CORNERS MAXIMUM .010
ALL WELDS TO BE CLEAN AND FREE OF SPATTER

ALL SURFACES TO BE FREE AND CLEAR OF SCRATCHES, RUST AND STAIN.
INTERPRET DIMENSIONS AND TOLERANCING PER ASME Y14.5M-1994

FINISH -

HEAT TREAT -

DO NOT SCALE DRAWING

Eastman Machine Co.
779 Washington Street, Buffalo, NY 14203-1396

TOOL HEAD PNEUMATICS, MPC

MULTI-PLY PNEUMATIC DIAGRAM

SCALE -
SIZE B
DRAWN BY J.ROGACKI
DATE 09/10/08

31-26659

SOLIDWORKS

Technical Data
EASTMAN® Mulyi-Ply Cutter

Multi-Ply Cutter

Maximum Gantry Speed ……	40 in/sec (102 cm/sec)
Maximum Conveyor Speed ……	8 in/sec (20 cm/sec)
Cut Accuracy * ……	+/- 0.010 in (0.025 cm)
Gantry Weight ……	260 lbs (118 kg)
Machine Voltage ……	208/220/380/400/415/440/575 VAC,
3 Phase	50/60 Hz
Blower Operating Voltage ……	220/440 VAC, 3 Phase, 60Hz
Minimum Operating Pressure ……	75 psi
Volume of Air Service ……	30 SCFM

Information based on standard 78" wide machine size
* Relative to type and quality of fabric, cutting speed, pulling mode operational settings.
* Conveyor pull accuracy to +/- 1/16" (+/- 1.6 mm)

Machine Size	**Working Width**	**Table Width** (including Rack and Rail)	**Overall Machine Width**
78" (198 cm)	78" (198 cm)	91" (231 cm)	113 1/2" (288 cm)

779 Washington St., Buffalo, N.Y. 14203-1396 U.S.A. • (716)856-2200 • Fax (716)856-1140 or (716)856-2068
Manufacturers of Eastman Cloth Cutting and Cloth Spreading Machines
Website: www.EastmanCuts.com
Form E-551