

# OPERATION and MAINTENANCE MANUAL



U.S. PATENT NO. 6,772,616

## SSH MultiPro™

### Light Commercial/Residential Roof Panel Machine

[www.NewTechMachinery.com](http://www.NewTechMachinery.com)

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# CHAPTER 1

## SSH SPECIFICATIONS

### SPECIFICATIONS

<b>SSH Dimensions:</b>	Length-12' 10"	(3.9m)
	Width -3' 10"	(1.2m)
	Height-4' 3"	(1.3m) w/Over Head Rack
	2' 0"	(.6m) w/o Over Head Rack
<b>SSH on Trailer:</b>	Length-18' 11"	(5.8m)
	Width-7' 2½"	(2.2m)
	Height-6' 3"	(1.9m) with reel
<b>SSH Weights:</b>	2360 lbs. (1070 kg)	Base Machine with Roller Set, Power Pack, and Rib Rollers
	2260 lbs. (1020 kg)	Trailer
	336 lbs. (152 kg)	Overhead Reel Rack
	80 lbs. (36 kg)	Expandable Arbor, each
	62 lbs. (28 kg)	10-foot Runout Table, each
	60 lbs. (27 kg)	PVC Strippable Film Applicator
<b>Speed:</b>	60 ft./min. Approx.	(18m/min.) Approx.
<b>Drive:</b>	Hydraulic via chain, sprocket and gear using 8 polyurethane drive rollers.	
<b>Shear:</b>	Hydraulically powered, infinitely adjustable, hardened tool steel dies and blades w/panel recognition proximity sensor.	
<b>Hydraulic Fluid:</b>	15 Gallons - 32AW	
<b>Coil Width</b>	14" to 24" (356mm to 610mm) Note: 24" coil width requires Expandable Arbor or Remote De-coiler Stand.	
<b>Materials Formed</b>	Painted Steel	28ga. to 24ga. (.4mm to .6mm) Painted, Galvanized, Aluminized
	<i>Note: -50 ksi maximum for 24ga. -50 ksi recommended, 80 ksi acceptable with adjustments for 28ga. to 26ga.</i>	
	Painted Aluminum	.027" to .040" (.7mm to 1.0mm)
	Copper	16 oz. to 20 oz. ¾ Hard (.5mm to .7mm)
	Terne-Coat Stainless Steel	26ga. (.5mm)
<b>Controls</b>	Standard:	12VDC Manual Control Box w/Length Control Limit Switch
	Optional:	PLC Computer Batch and Length Control



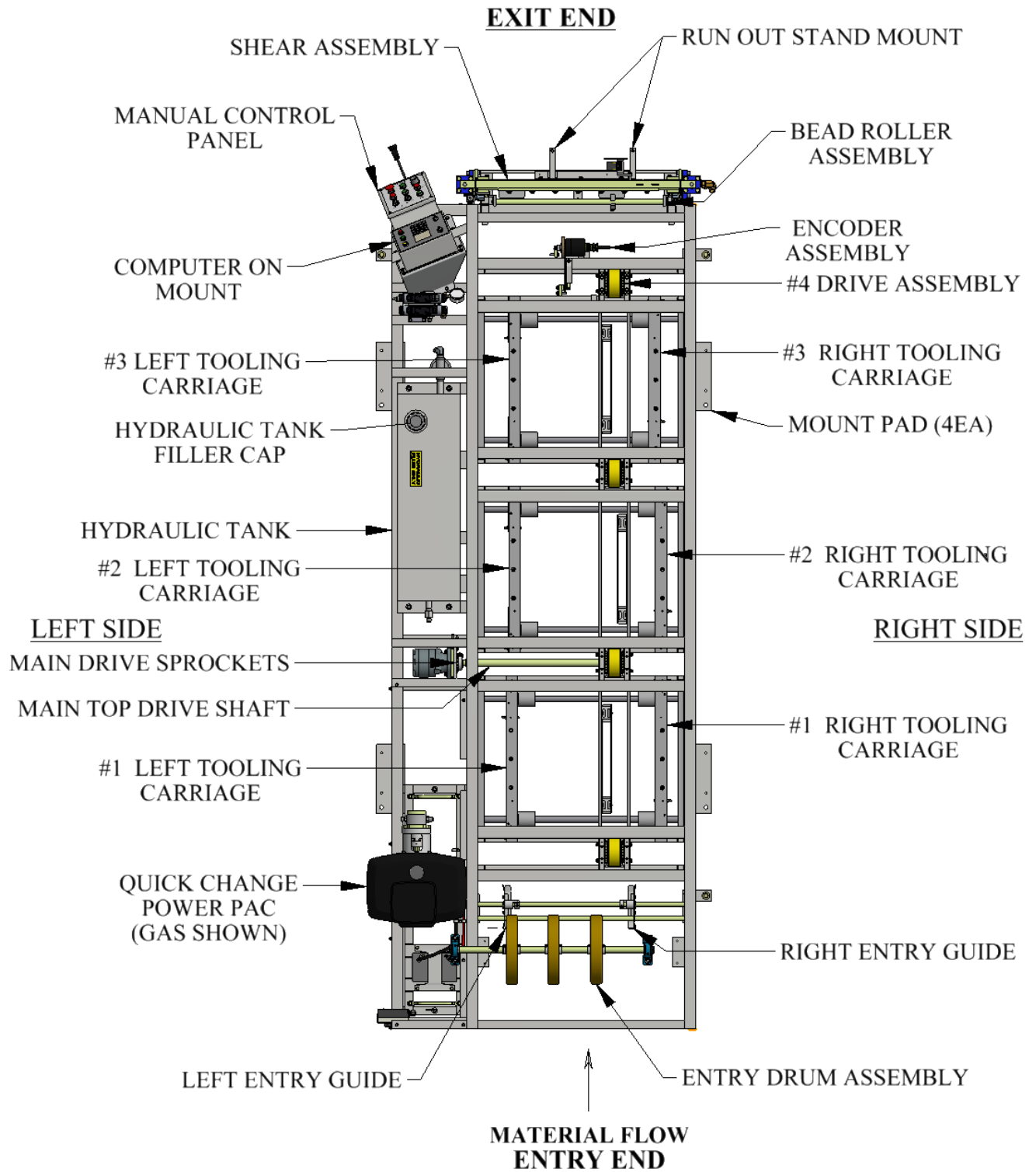
CHAPTER 2  
**PRECAUTIONS**

## **PRECAUTIONS**

1. **Make sure the operator of the machine has read and understands this manual in its entirety before attempting to operate this equipment.**
2. **ALWAYS** keep covers, guards and lids mounted to machine during operation.
3. **OBSERVE and OBEY** all safety and warning signs affixed to the machine.
4. **ALWAYS** adhere to and follow all local and national safety codes concerning the loading and un-loading of reeled coils.
5. **USE ONLY** properly rated devices for lifting reeled coils into or out of the reel stand assembly.
6. **DO NOT** wear loose clothing, jewelry etc. that could become entangled in the moving parts of the machine when operating.
7. **STOP THE MACHINE** and disconnect the power before attempting to make any adjustments, perform any maintenance or changeover procedures.
8. **AVOID** storing the machine outdoors for long periods of time. Cover with a tarp but provide good ventilation to prevent condensation and rust.
9. **DO NOT USE SOLVENTS TO CLEAN DRIVE ROLLERS!**
10. **ALWAYS EMPTY MACHINE OF MATERIAL BEFORE TRANSPORT AND STORAGE.**

CHAPTER 3  
**MACHINE ORIENTATION**

**MACHINE ORIENTATION**



**Figure 1: Machine Orientation**



**EXIT END**



## CHAPTER 4

# GENERAL MAINTENANCE

## GENERAL MAINTENANCE

1. Always keep covers on during operation and storage. The covers are for operator safety, but also protect the internal components of the machine from the environment.
2. Avoid storage of the machine outdoors for long periods of time. Cover the machine with a tarp to protect it but provide good ventilation to prevent condensation and rust.
3. Keep the machine clean. This will increase the life of the machine and make maintenance easier. A clean machine will provide a clean product.
4. Before operating the machine, visually inspect for foreign objects, debris or anything unusual. If something doesn't seem correct, inspect and remedy prior to operation.
5. Keep chains properly tensioned. This will add to the life of the chains and sprockets. The chains should be just snug. An over-tightened chain is just as bad for the machine as a loose chain. Idler sprockets are provided on each chain for this purpose.
6. Lubricate the chains a minimum of every 40 hours of operation. It is preferable to use a dry motorcycle chain lube or equivalent.
7. Keep Entry Guide Carriage clean and lubricate as needed with Spray Lube.
8. Keep Bead Roller Carriage Shafts (Figure 25 on page 37) clean and lubricate with Spray Lube.
9. Keep Arbor Cradles (Figure 10 on page 18) lubricated with Clear Grease.
10. Lubricate Arbor Nut (Figure 8 on page 15) using a grease gun with EP Grease when threads begin to look dry.
11. Clean Forming Rollers as needed with a Scotch Brite Pad and a small amount of solvent.
12. Clean Drive Rollers with soap and water or mild solvent-free spray cleaner. **CAUTION: Do not use harsh chemicals or solvents or damage will occur.**
13. Lubricate both faces of the Shear Blades and Dies (Figure 19 on page 31) a minimum of once daily with Spray Lube. More should be added as needed before the cut edges begin to deteriorate.



CHAPTER 4  
**GENERAL MAINTENANCE**

***Recommended Lubricants and Fluids***

**Spray Lube for:**

Shear Blades, Shear Dies, Entry Guide, Bead Roller Carriage Shafts and chains

**Super Lube - Multi-Purpose Synthetic Aerosol Lubricant with Syncolon (PTFE)**

Catalog No. 31110

**11 oz. Aerosol Can**

**Available from:**

**MSC Supply at 1-800-645-7270**

**Clear Grease for:**

Arbor Cradles

Synthetic Extreme Pressure, High Temperature Grease with Syncolon (PTFE)

Catalog No. 71160

**400 gram container**

**Available from:**

**MSC Supply at 1-800-645-7270**

**EP Grease for:**

Arbor Nuts and Pillow Blocks

Grease - Lubricants Type: Moly Ep Grease

Catalog No. 11335

**14 Ounce Container**

**Available from:**

**Various Manufacturers**

**Hydraulic Fluid (32AW) for:**

Hydraulic Tank

**Available from:**

**Various Manufacturers**

CHAPTER 5  
**ELECTRICAL CONTROLS AND OPERATION**

## **ELECTRICAL CONTROLS AND OPERATION**

### **POWER CORD REQUIREMENTS**

For machines equipped with a QCPP-E it is very important to follow the power cord requirement prescribed by the motor and electrical control manufacturers to maintain their respective warranties. Make sure the cord being used is marked properly. Do not assume that because an extension cord looks heavy enough that it is the right gauge. **Use of the wrong gauge extension cord will void the warranty on motor and electrical controls.**

### **GENERATOR USE FOR ELECTRIC MOTOR MACHINES**

If a generator will be used to power the machine it must be large enough to handle the amp draw requirements of the motor. Contact a local generator supplier for proper sizing and refer to the specification plate on the electric motor. **Use of an improperly sized generator will cause a low voltage situation of the electric motor and controls which will void the warranty.**

### **MANUAL CONTROL PANEL OPERATION:**

(Figure 3 on page 10)

A. FORWARD-REVERSE Switch

This selector switch controls the direction of movement of the material through the machine. Select forward to feed material and run panel through the machine. Reverse should only be used for troubleshooting. Do not back up the panel more than a few inches or the panel could get jammed in the forming rollers.

**NOTE: For operator safety, the machine will NOT run continuously in reverse.**

B. JOG-RUN Switch

This selector switch allows the machine to run continuously or jog material through the machine. Select JOG to load coil into machine and to move material through the machine in small increments until it clears the shear dies. Select run after material has cleared the shear and the machine is ready to run.

**NOTE: The LENGTH CONTROL LIMIT SWITCH must be plugged in to the Limit Switch Plug at the bottom of the Manual Control Box Assembly to run continuously.**

C. START FEED (Green button)

This button is used to activate the drive system of the machine. (Jog only unless limit switch is plugged in)

D. STOP FEED (Red button)

This button acts as a cycle interrupt for the drive system. **Pressing the Stop Feed Button on either the entry or exit end of the machine will stop the machine drive system.**

E. SHEAR DOWN (Green button)

Pressing this button once will cycle the shear to the bottom of its stroke and return it back to the top or home position. This is one shear cycle.

## CHAPTER 5

# ELECTRICAL CONTROLS AND OPERATION

F. SHEAR UP (Red button)

Pressing this button during the down cycle of the shear will immediately send the shear back to the top or home position.

G. EMERGENCY STOP-POWER ON (Raised Red Mushroom button)

**Function #1 (Power On)**

Pull this button OUT prior to starting the machine.

**Function #2 (Emergency Stop-Power Off)**

Once the machine is running, pushing this button IN will stop all functions and completely shut down the machine including the engine. If the shear is in the down cycle it will freeze it in position. The shear will return back to the top of stroke or home position once the engine or motor is re-started. This button is also used to shut the machine down when not in use. ***Failure to push this button in prior to storage, even overnight, could result in a dead battery on gas engine models.***

H. MOTOR START (Green button)

**The Emergency Stop-Power On button must be pulled out before the Start Button will function.**

Press this button momentarily to start the Electric Motor machine.

Press and hold this button until the engine starts on a Gas Engine model.

## ENTRY END CONTROL STATION

A. JOG SWITCH

This switch is used to load coil into the machine. Turn the switch to the right to jog the material forward or turn the switch to the left to jog the material in reverse.

B. STOP FEED (Red button)

This button acts as a cycle interrupt for the drive system. **Pressing the Stop Feed Button on either the entry or exit end of the machine will stop the machine drive system.**

## MAIN CONTROL CABLE

(Figure 4 on page 11)

- A. The main control cable is the communication cable for the Manual Control Panel described above and the Computer Batch and Length Control Computer covered in Appendix B. This cable must be connected to one or the other in order for the machine to operate.
- B. The Main Control Cable exits thru the panel below and under the left corner of the Manual Control Panel. There are three cables there and it is the larger diameter plug of the three. It has a key and slot configuration that must be aligned before the male/female connection can be made on the Manual Control Panel or Batch and Length Control Computer. This prevents misalignment and damage to the pins.

### Manual Control Panel Connection

Connect the Female end of the Main Control Cable to the panel mounted male connection located at the bottom left corner of the Manual Control Panel. Make sure that the key and slot are aligned and carefully start the threads on the connection and turn clockwise until snug.

## CHAPTER 5

# ELECTRICAL CONTROLS AND OPERATION

### **Batch and Length Control Computer Connection**

Connect the Female end of the Main Control Cable to the panel mounted male connection located in the bottom of the computer on the right side. Make sure that the key and slot are aligned and carefully start the threads on the connection and turn clockwise until snug.

### **REMOTE LIMIT SWITCH**

(Figure 5 on page 12)

Note: The machine will NOT run continuously in the forward direction unless the REMOTE LIMIT SWITCH is plugged into the machine. The Remote Limit Switch is used for manual panel length control. The remote limit switch is designed to attach to the right side of the optional run-out tables. Plug the female end of a 3-wire 14-gage extension cord into the limit switch, and the male end into the female Limit Switch Plug located at the bottom of the Control Panel Assembly. The length of the panel intended to run determines length of the extension cord needed. Run out a panel to the desired length and stop the machine. Slide the Remote Limit Switch onto the bottom of the angle on the right side of the run out table so that the ARM of the switch is against the end of the panel. See section **RUN OUT TABLES AND REMOTE LIMIT SWITCH** on page 50.

### **FUSES**

(Figure 6 on page 13)

All machines, gas or electric powered, have a 10-amp time delay fuse on the back of the Electrical Control Panel Assembly. This fuse protects the electrical components. If the fuse is blown, the machine will lose all functions except Motor Start. Access can be gained by removing the exit end left side cover. This is a panel mounted, spring loaded fuse holder. **To replace this fuse:** Push in on the cap and turn counterclockwise to release fuse. Check fuse with a continuity tester. If the fuse is bad replace with a new fuse. To re-install, insert fuse into cap. Install fuse and cap assembly into receptacle, push down and turn clockwise to lock in place.

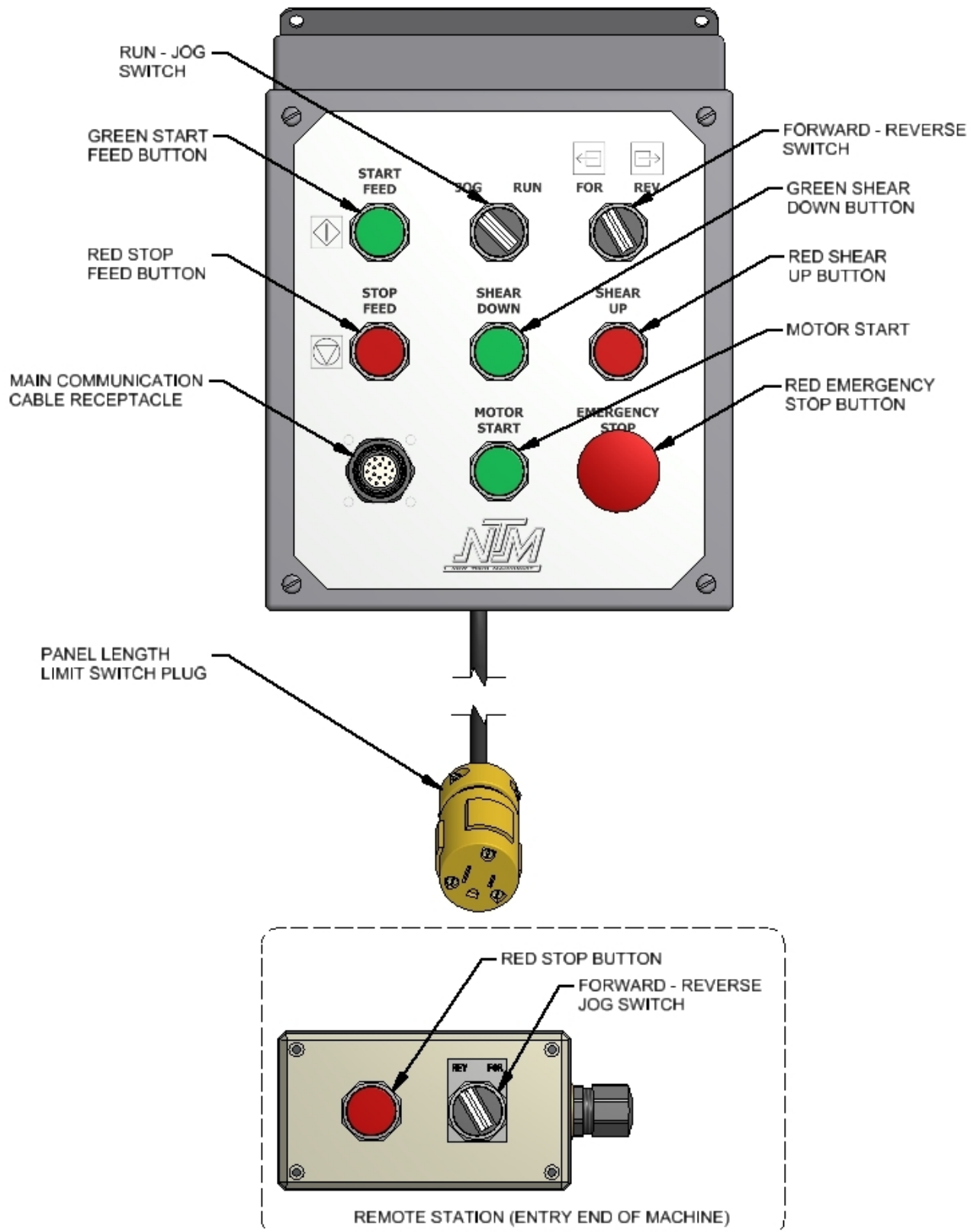
### **ELECTRIC MOTOR MACHINES**

(Figure 7 on page 13)

Electric motor machines have an additional 10-amp time delay fuse protecting the logic circuit of the Contactor Box. This fuse holder is mounted in the top cover of the contactor box located toward the entry end on the left side. Access can be gained by removing the entry end left side cover. This is a panel mounted, spring loaded fuse holder. **To replace this fuse:** Push in on the cap and turn counterclockwise to release fuse. Check fuse with a continuity tester. If the fuse is bad replace with a new fuse. To re-install, insert fuse into cap. Install fuse and cap assembly into receptacle, push down and turn clockwise to lock in place.

# CHAPTER 5

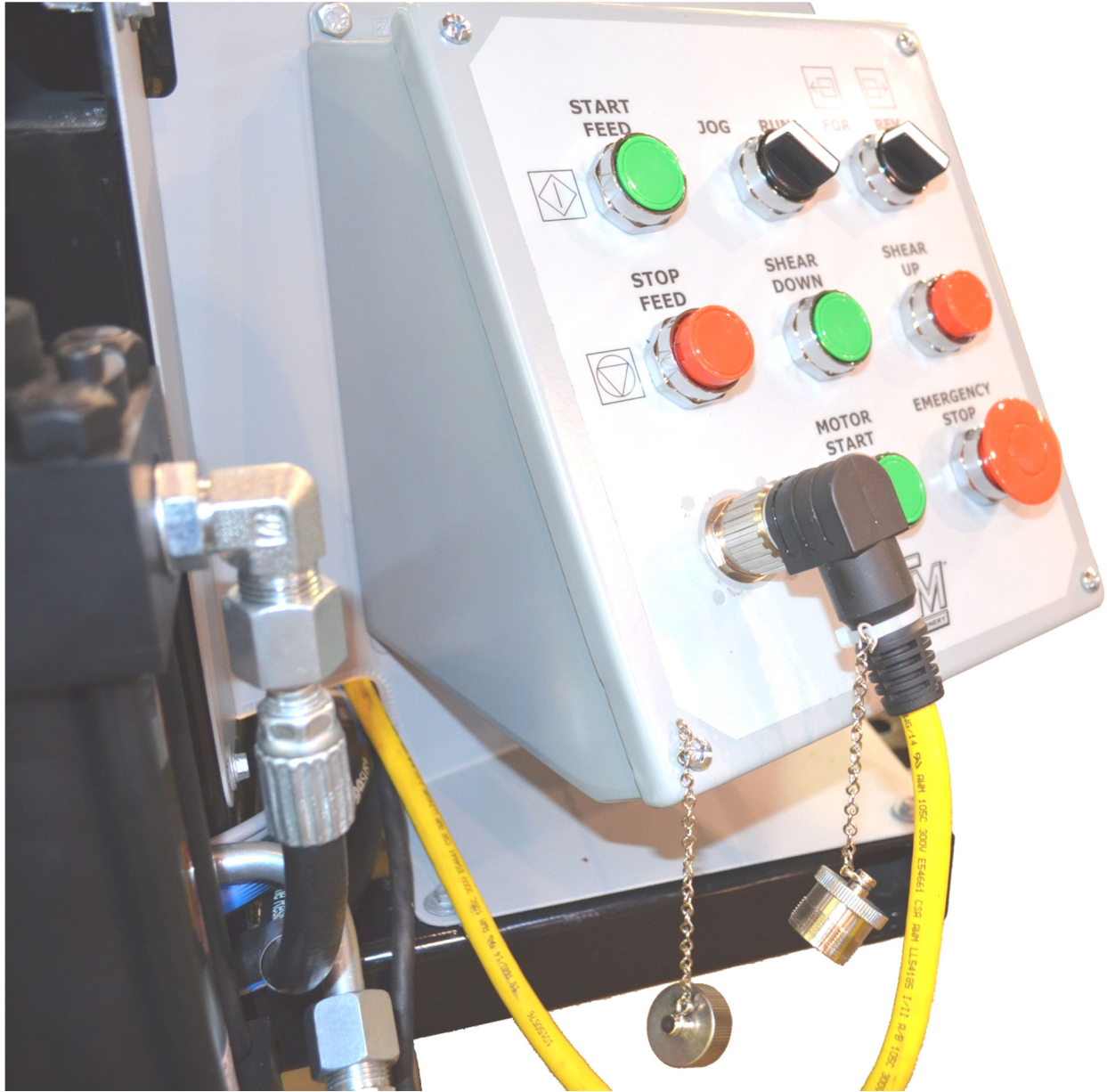
## ELECTRICAL CONTROLS AND OPERATION



**Figure 3: Controls**

CHAPTER 5

**ELECTRICAL CONTROLS AND OPERATION**

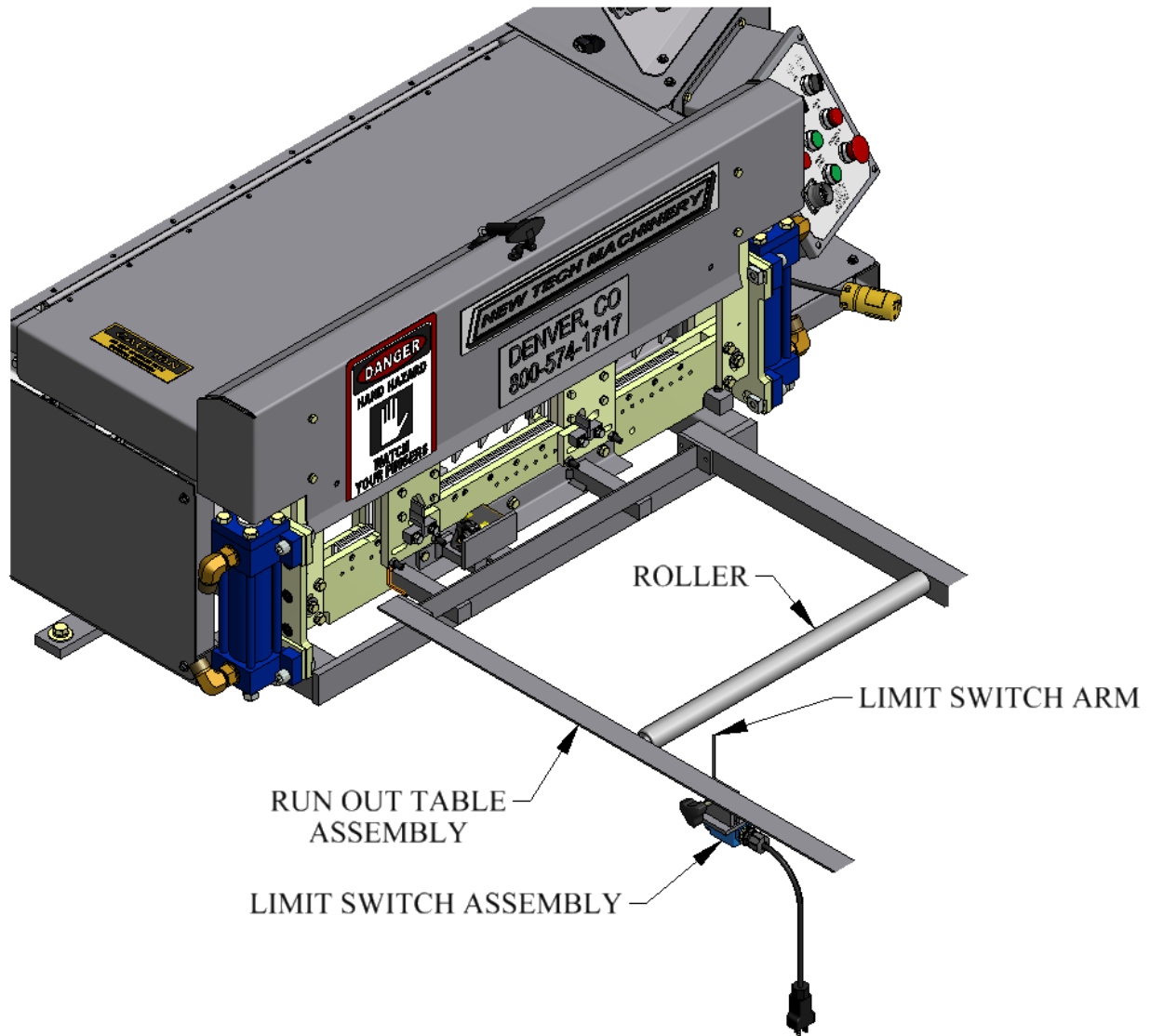


**Figure 4: Main Control Cable**



CHAPTER 5

**ELECTRICAL CONTROLS AND OPERATION**

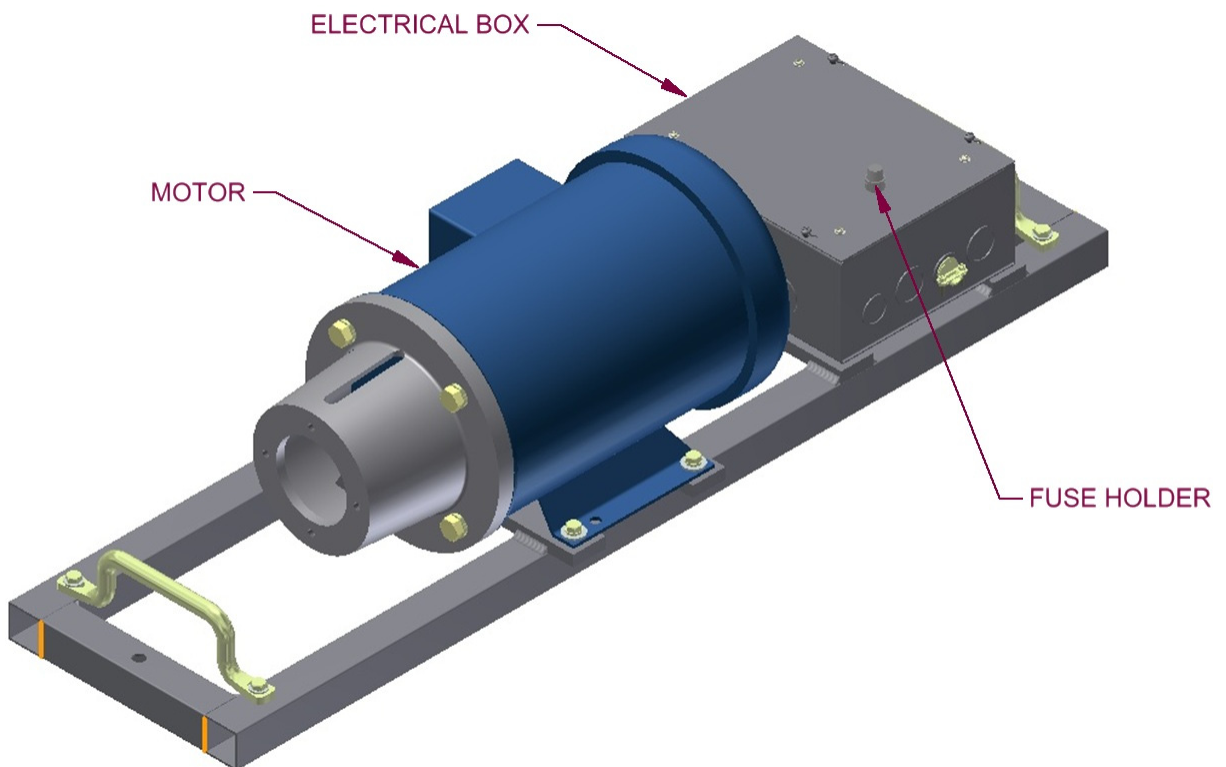


***Figure 5: Run Out Table and Remote Limit Switch***

CHAPTER 5  
**ELECTRICAL CONTROLS AND OPERATION**



**Figure 6: Main Control Box Fuse**



**Figure 7: QCPP E 1-6 Fuse Location**

CHAPTER 6  
**REEL STANDS, REELS AND EXPANDABLE ARBORS**

## **REEL STANDS, REELS AND EXPANDABLE ARBORS**

### **EXPANDABLE ARBOR**

(Figure 8 on page 15)

The Expandable Arbor adjusts to accommodate coils with 16” to 20” inside diameters by expanding into the ID of the coil.

### **THREADED NUT**

The threaded nut should always be on the right side of the machine and the tail of the coil should always be routed over the top and pointing toward the entry end of the machine.

This threaded nut is used to increase or decrease the outside diameter of the arbor. Turning the nut clockwise will increase the outside diameter of the arbor, and counter-clockwise rotation will decrease the arbor size. There is a grease zerk in the collar of the threaded nut that should be lubricated at least twice a year, or whenever grease is not visible on the threads of the shaft.

### **END COLLAR**

The End Collar has two positions.

Position “A” is used for coils with inside diameters of 16”.

Position “B” is used for coils with inside diameters of 20”.

To adjust from one position to the other, remove 2 cap screws “C” until end collar is free to slide. Slide it to the inside position for 20” ID or outside position for 16” ID coil. Align it to the respective threaded holes in the reel shaft. Re-insert and tighten “C” cap screws to lock the end collar to the shaft.

### **LOADING EXPANDABLE ARBORS WITH COIL**

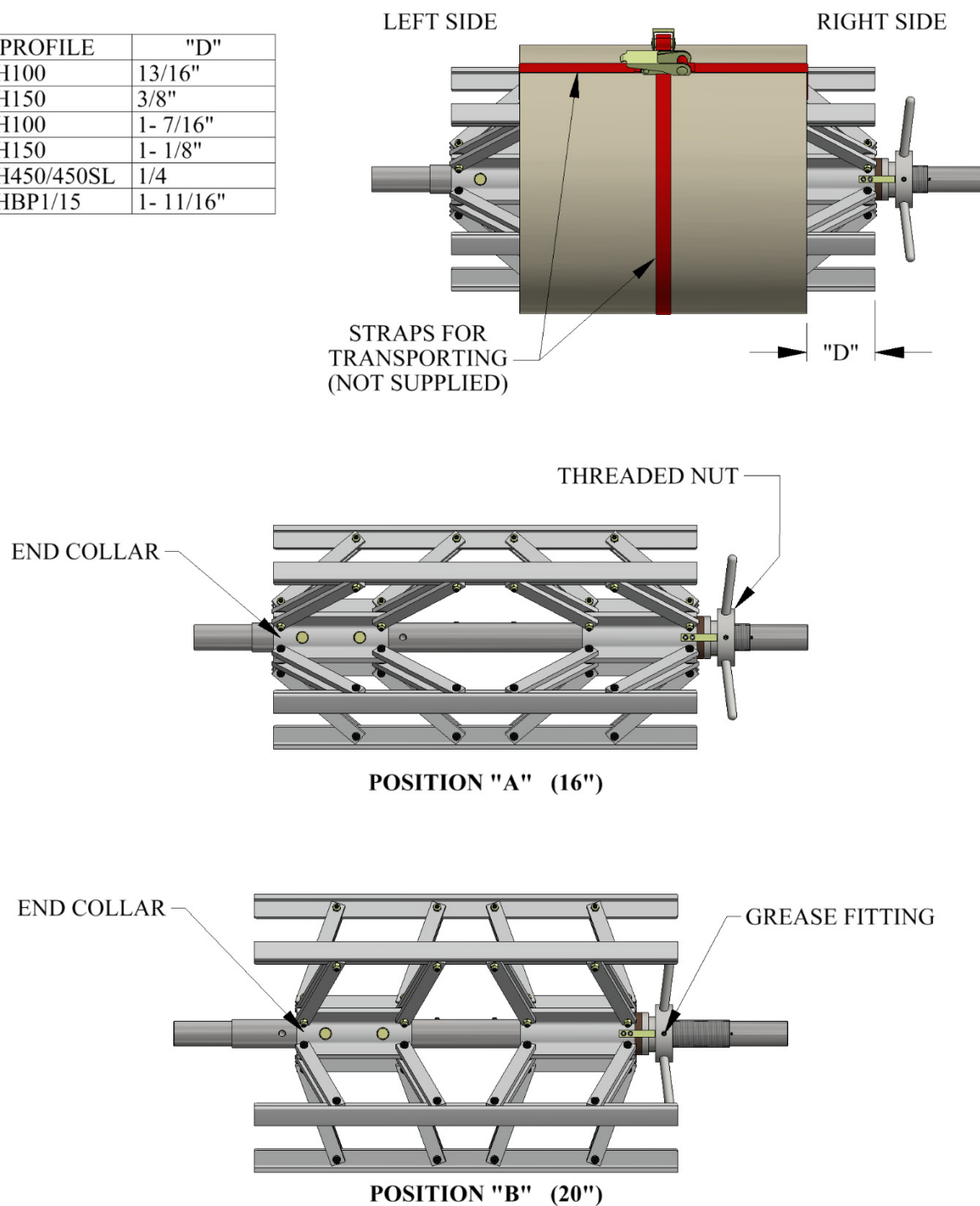
1. Using the Threaded Nut, collapse the arbor small enough to fit into the inside diameter of the coil.
2. Slide the Expandable Arbor into the center of the coil making sure the threaded nut is on the right and the tail of the coil is over the top and pointed toward the entry end of the machine.
3. Turn the Threaded Nut clockwise until the Support Bars on the arbor are just snug against the inside of the coil.
4. Using the Reel Set Up Chart, (Figure 8 on page 15), find the “D” dimension that corresponds to the profile being used.
5. Slide the arbor left or right to get the correct “D” dimension measuring from the edge of the coil to the end of the Support Bar on the Threaded Nut side.
6. Finish by rotating the Threaded Nut clockwise until the Support Bars are very tight against the inside of the coil. Verify that dimension “D” is correct, and re-adjust if necessary. The Coil and Arbor are now ready for loading. (see LOADING REELED COIL on page 19)

# CHAPTER 6

## **REEL STANDS, REELS AND EXPANDABLE ARBORS**

### EXPANDABLE ARBOR SET-UP

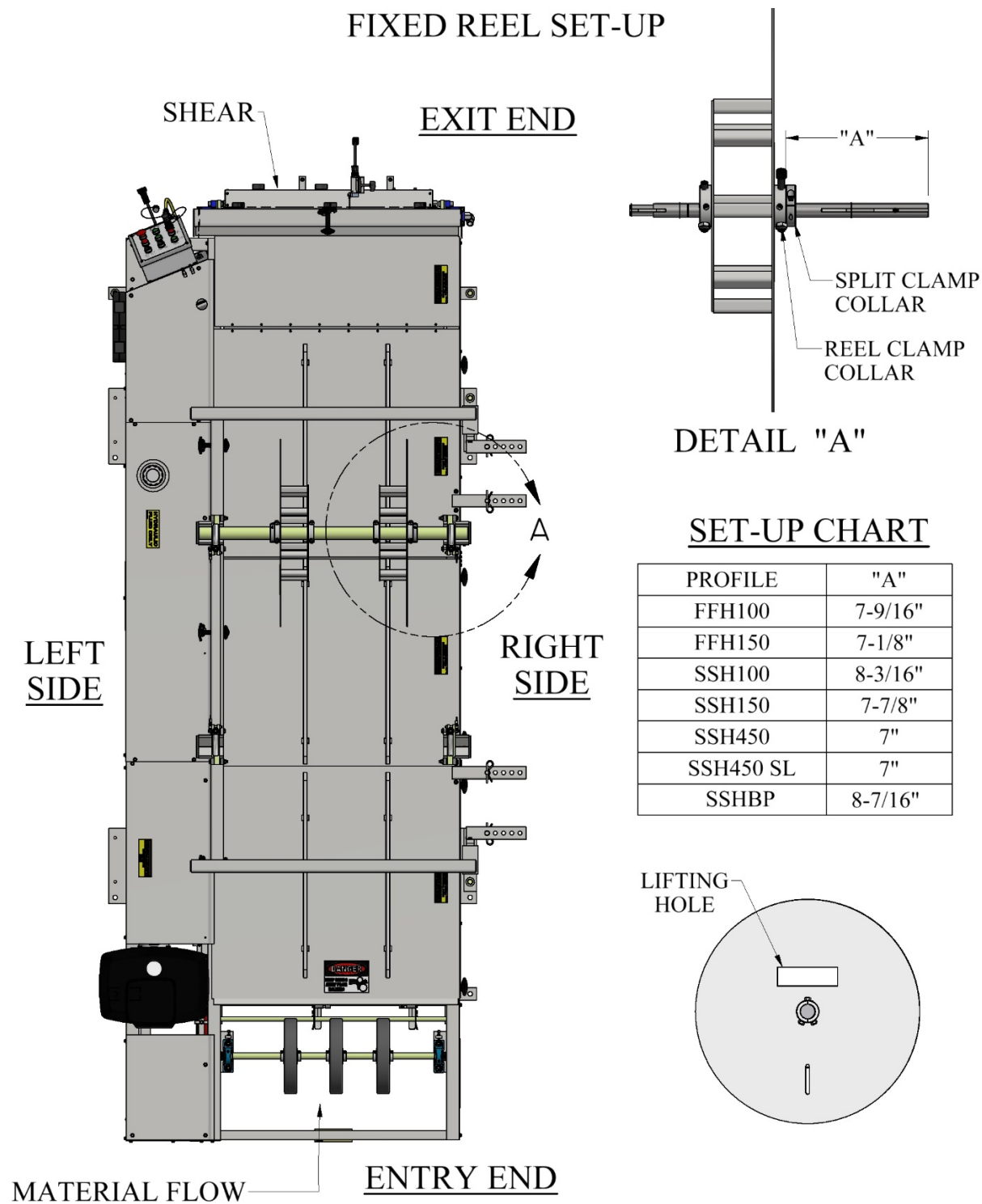
PROFILE	"D"
FFH100	13/16"
FFH150	3/8"
SSH100	1- 7/16"
SSH150	1- 1/8"
SSH450/450SL	1/4"
SSHBP1/15	1- 11/16"



**Figure 8: Expandable Arbor Set-Up**

# CHAPTER 6

## REEL STANDS, REELS AND EXPANDABLE ARBORS



**Figure 9: Fixed Reel Set-up**

CHAPTER 6

**REEL STANDS, REELS AND EXPANDABLE ARBORS**

**CAUTION: Always use properly rated lifting devices to load and unload coils.**

Maximum Capacity / Reel: **3,000 lbs.**

Total Capacity for Reel Stand: **6,000 lbs.**

1. The reel shafts must rest in the arbor cradles on the reel rack. Keep the arbor cradles lubricated with clear grease to minimize wear. (Figure 10 on page 18.)
2. Use the Hold Down Bars on each cradle to secure the coil and reel to the reel stand during both operation and transit of the machine. The Hold Down Bar should be used to keep the coil from uncoiling too fast during the fabrication of panels. Apply just enough drag to keep coil tensioned.

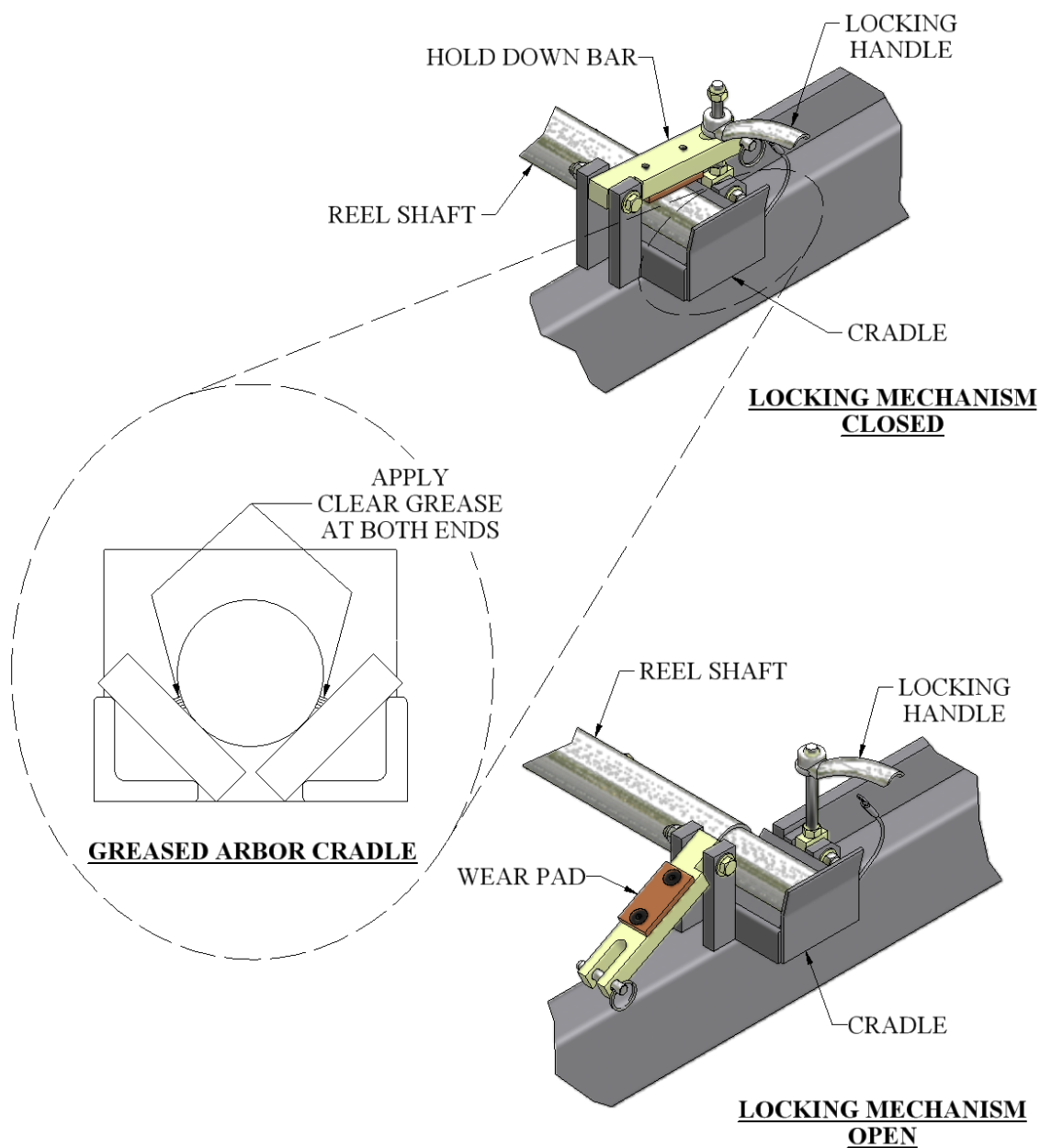
**Caution: Do not over tighten Hold Down Bars during machine operation.** This will cause excessive load on the drive and electrical systems and premature failure will result.

**DO tighten Hold Down Bars** tightly prior to transport of the machine.

3. If a Remote Decoiler is used it should be placed 8 to 10 feet behind the machine. Align it as close as possible to the Right Side Entry Guide line of fire, making the side of the coil and reel parallel to the machine. NOTE: The closer the Decoiler and reel are set to the machine, the more critical this alignment becomes.

CHAPTER 6

## **REEL STANDS, REELS AND EXPANDABLE ARBORS**



**Figure 10: Expandable Reel Assembly**



## **REEL STANDS, REELS AND EXPANDABLE ARBORS**

### **LOADING REELED COIL**

**Caution:**

**Always use a forklift or other approved lifting device to load or unload Fixed Reels or Expandable Arbors loaded with coil.**

**The Lifting Holes in the Fixed Reel sides are provided to make loading safer and easier.**

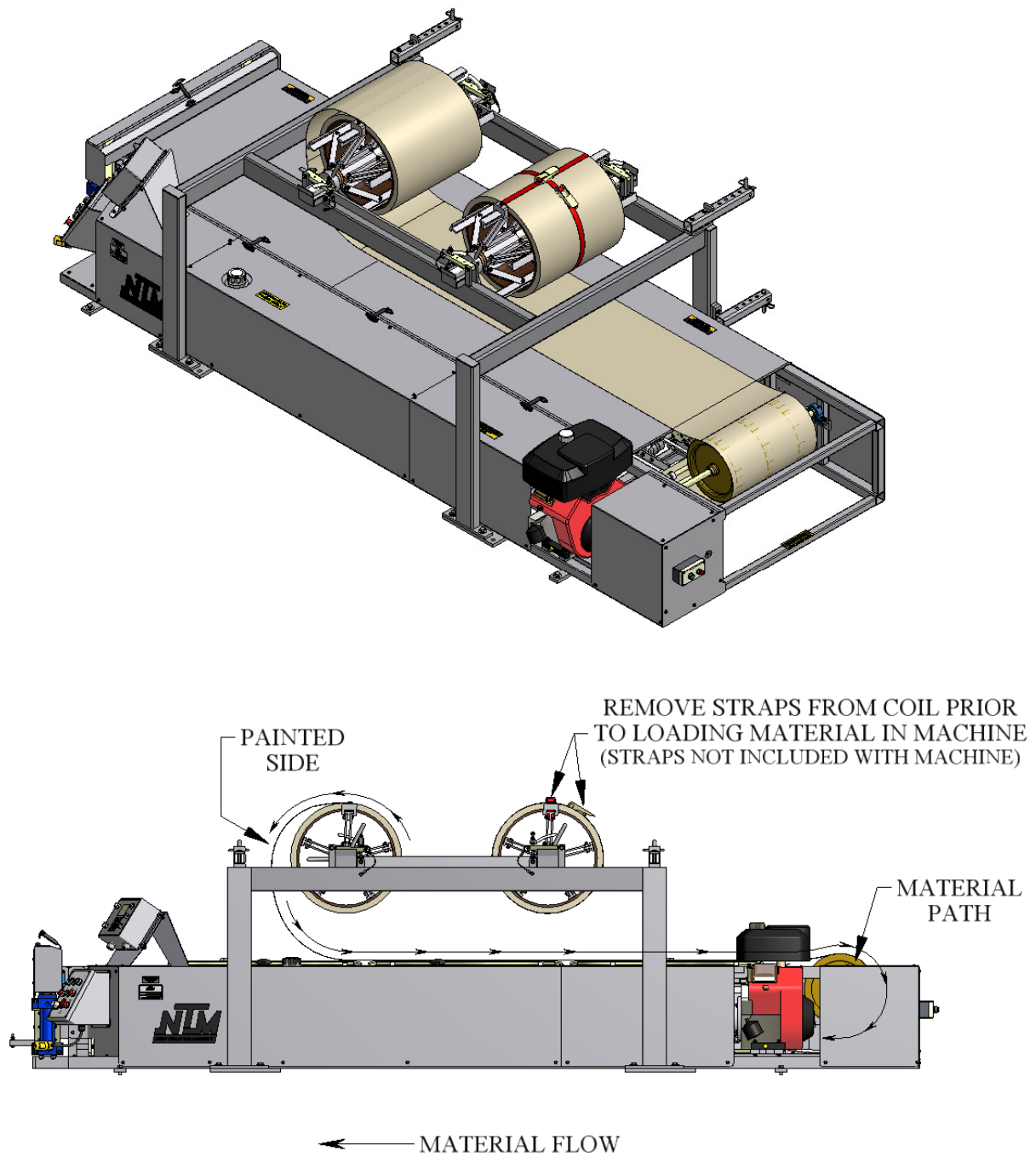
**DO NOT use lifting straps through the lifting holes as the sharp edges may cut the straps.**

1. Prepare the reel stand by making sure the Hold Down Bars are in the unlocked and open position (Figure 10 on page 18.)
2. Using an approved lifting device, lift the reeled coil into the cradles on the reel stand making sure that the tail of the coil is in the correct position to route the material as shown in Figure 11 then remove the lifting device.
3. Rotate the Hold Down Bars to the closed position and thread the handle onto the hold down bolt. If material is going to run panel from this coil, tighten the left and right handle just snug. Final adjustment of tension should be made while running a panel to keep reel from unwinding material too fast. As the coil becomes smaller, re-adjustments will need to be made. **Caution: Do Not over tighten Hold Down Bars. Drive and/or electrical system failure may occur.**
4. If material is loaded onto the Expandable Arbor, tighten the Hold Down Bars securely to keep coil from unwinding during transport and secure the loose end of the material to the coil.
5. Before transporting the loaded Expandable Arbor, using a strap or rope, secure the coil around the outside edges through the inside diameter to prevent the coil from telescoping (Figure 8 on page 15).

**NOTE: Make sure Hold Down Bars are tightened securely and coil is properly tied off before transporting machine.**

CHAPTER 6

**REEL STANDS, REELS AND EXPANDABLE ARBORS**



**Figure 11: Material Routing**

CHAPTER 7  
**HYDRAULIC SYSTEM AND SCHEMATIC**

## **HYDRAULIC SYSTEMS**

### ***Maintenance***

(Figure 12 on page 22.)

The hydraulic system in the machine is a very durable and reliable system, however, it must be properly maintained to ensure trouble free operation and longevity. The factory has installed 32 weight AW hydraulic fluid. Because this equipment is used primarily outdoors and exposed to the elements, it is recommended that the oil be changed annually. Hydraulic oil will degrade if it remains stagnate in the system for long periods of time. Check the fluid level weekly. It should be approximately 5" below the top of the filler neck. When checking the fluid level, also note the color and condition of the fluid. It should be clear in color.

### ***Hydraulic Fluid Troubleshooting***

	CONDITION	SOLUTION
1	White milky color indicates water contamination.	Change the fluid.
2	Dark fluid usually indicates a dirty oil filter.	Replace the oil filter and fluid.
3	Foamy fluid will cause a noisy pump and slow erratic operation of the system. The cause is usually low oil level or air in the system.	Check fluid level and bleed off air by pushing the shear down button and holding for 10 seconds.
4	Machine runs slow after continuous operation. Check hydraulic fluid temperature, it should be no more than 140°F (60°C).	Allow to cool down. Move to a shaded area if possible.

### ***Changing Hydraulic Fluid and Filter***

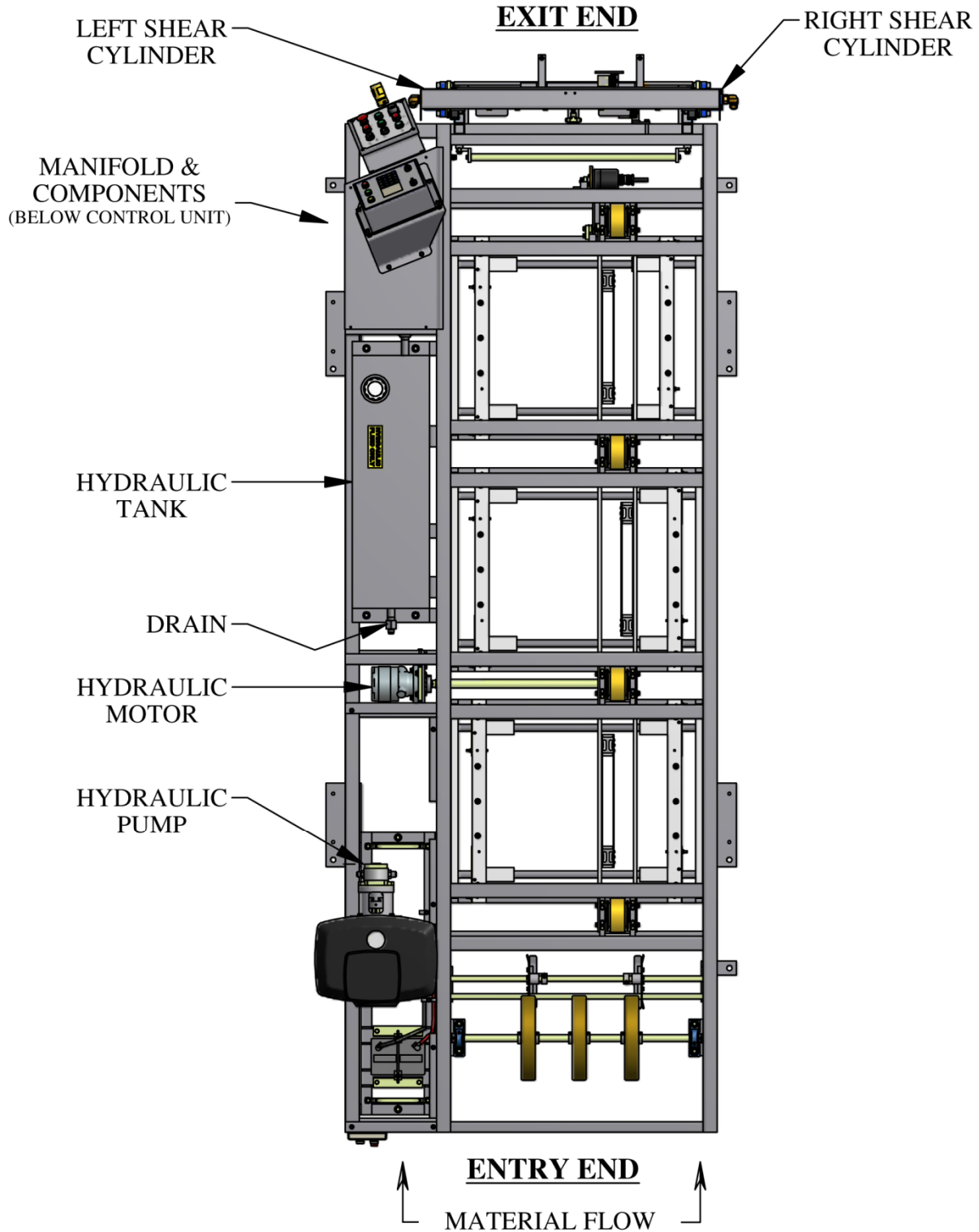
(Figure 13 on page 23 and Figure 14 on page 23)

The hydraulic fluid should be changed at least once a year. More frequently if the machine is constantly in operation in a dusty environment or if the fluid becomes contaminated. To change the fluid:

1. Remove the Filler Cap from the Hydraulic Tank.
2. Using a hand pump, remove the hydraulic oil from the Hydraulic Tank. Tip the entry end of the machine up so that the remaining oil runs to the filler end of the tank and hand pump the remaining oil from the tank.
3. Remove the existing Hydraulic Filter and replace with a new Hydraulic Filter.
4. Fill the tank with fresh 32 weight fluid until it is 8" below the top of the Filler Neck (approximately 15 gal).
5. Replace the Filler Cap.
6. Cycle the drive and shear circuits to ensure that there is no air in the hydraulic system.

CHAPTER 7

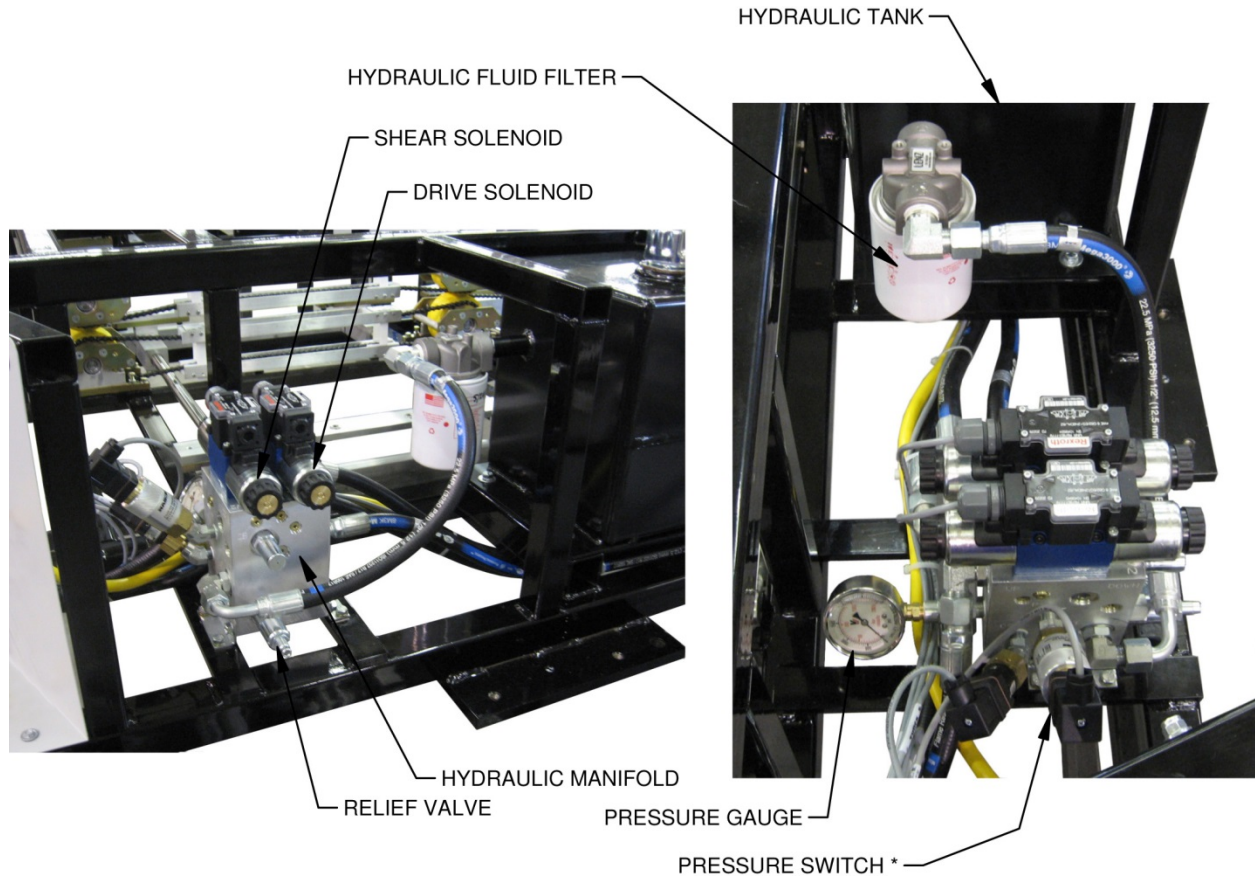
## HYDRAULIC SYSTEM AND SCHEMATIC



*Figure 12: Hydraulic System Overview*

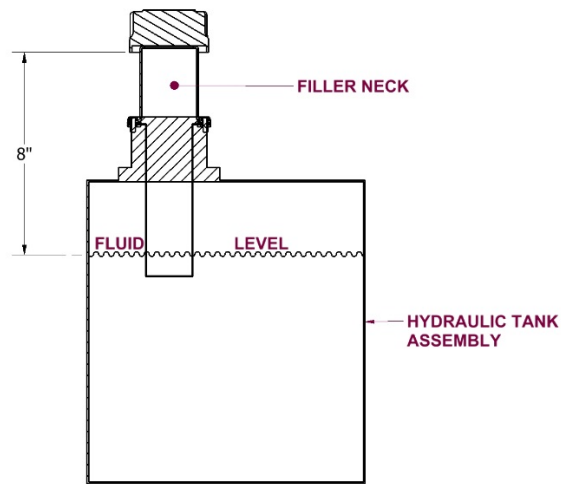
## CHAPTER 7

# HYDRAULIC SYSTEM AND SCHEMATIC



\* Note: Machines manufactured after April 2013 do not have a pressure switch.

**Figure 13: Hydraulic System – Details**



**Figure 14: Hydraulic Fluid Level**

## CHAPTER 8

# DRIVE SYSTEM

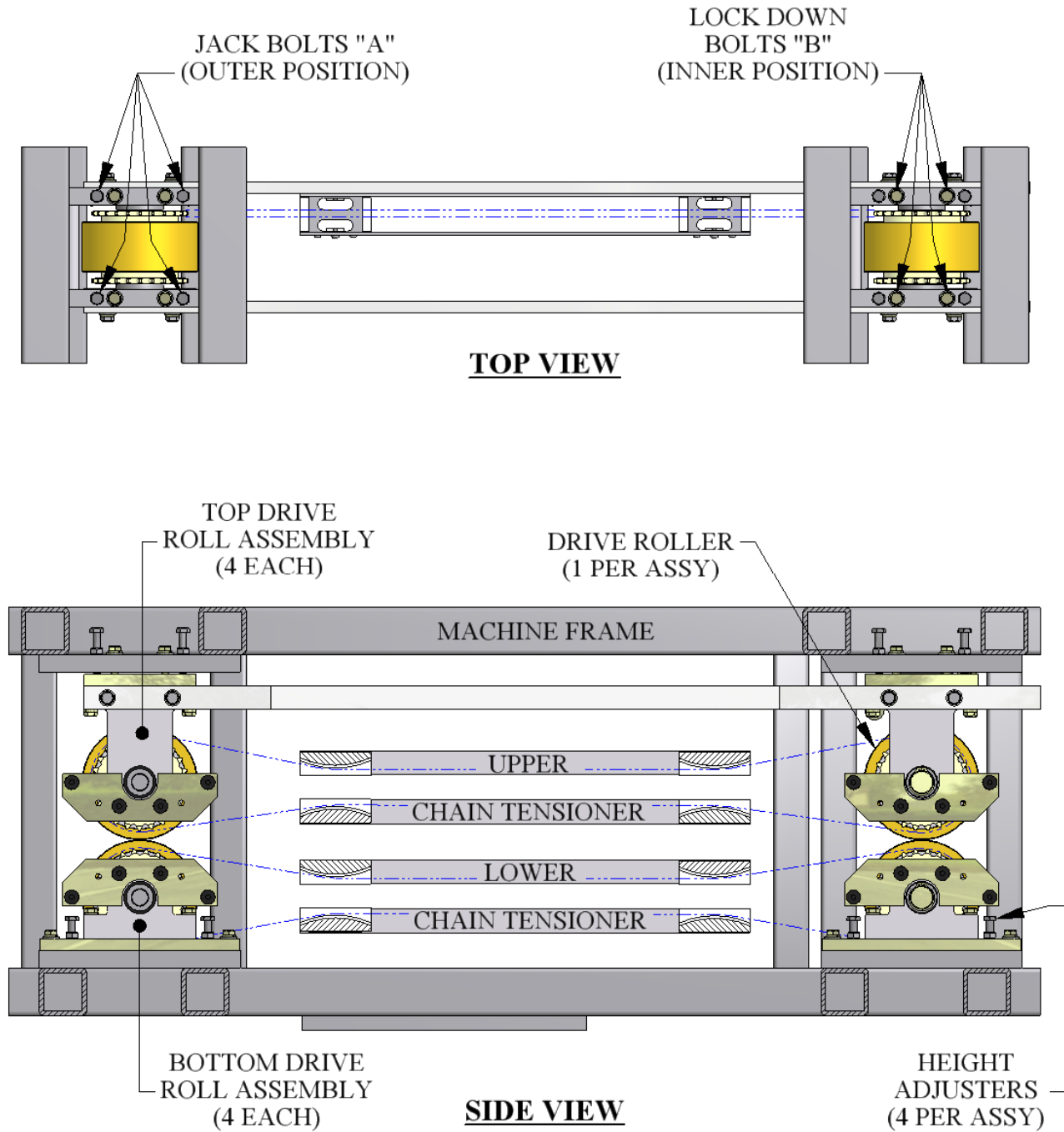
## DRIVE SYSTEM

(Figure 15, Figure 16, and Figure 17 .) pages 25, 26 and 27.

The drive system in the machine consists of four top and four bottom polyurethane drive rollers. They are connected together via chain and sprocket. There are chain tensioners on each assembly. The drive system is powered by a hydraulic motor which transfers power to the drive assemblies using a drive sprocket connected to the top and bottom drive shafts.

1. Clearance between the top and bottom drive rollers is factory set at  $\frac{3}{4}$  of a turn of pressure past the point of contact. This will drive material up to 24ga. through the machine without the need for adjustment. If adjustment becomes necessary due to slippage, add pressure. **Do not add more than  $\frac{1}{4}$  turn beyond the factory setting.** It is important to adjust only one end of each assembly at a time to maintain side to side alignments.  
**To add pressure:** Loosen two Lock-Down Bolts "B"  $\frac{1}{8}$  of a turn. Loosen lock nuts on two corresponding Jack Bolts "A". Tighten Bolts "A"  $\frac{1}{8}$  of a turn. Re-tighten 2 lock nuts on Jack Bolts "A" to lock in adjustment. Repeat this procedure on the other end of the Drive Assembly and repeat for the other 3 drive assemblies. Test for result and repeat one more time if necessary.  
**To remove pressure:** Loosen two lock nuts on Jack Bolts "A". Loosen two Jack Bolts "A"  $\frac{1}{8}$  of a turn. Tighten two corresponding Lock-Down Bolts "B"  $\frac{1}{8}$  of a turn. Tighten two lock nuts on Jack Bolts "A" to lock in adjustment. Repeat this procedure on the other end of the Drive assembly.
2. The chain tensioners used on this machine are squeeze type that can be manually pressed together when additional chain tension is required. When tensioning any chains be sure and squeeze the tensioners at both ends of the chain in order to maintain an even gap along the tensioner bars.
3. The chains used in this system are #50 Roller Chain at the drive sprocket and #41 Roller Chain between drive rolls. See Figure 17 on page 27 for chain locations and lengths if chain replacement is necessary.
4. The polyurethane drive rollers require occasional cleaning. The need for cleaning will become evident when the drive rolls start leaving a stripe the width of the drive roller on the formed panels that is not easily removed. Avoid cleaning the drive rollers with harsh chemicals or solvent. These products will attack the polyurethane and cause irreversible damage. **Use of these products will void the warranty on the drive rollers.**  
Clean the rollers with mild soap and water and a rag. **Shut off the machine and disconnect the power before cleaning the drive rollers.**
5. Covers should be kept on the machine during operation and storage. Ultraviolet light will attack the polyurethane drive rollers and cause deterioration. Again, this type of damage is not covered under the warranty.

CHAPTER 8  
**DRIVE SYSTEM**



**Figure 15: Drive Roll Assembly**



# CHAPTER 8

## DRIVE SYSTEM

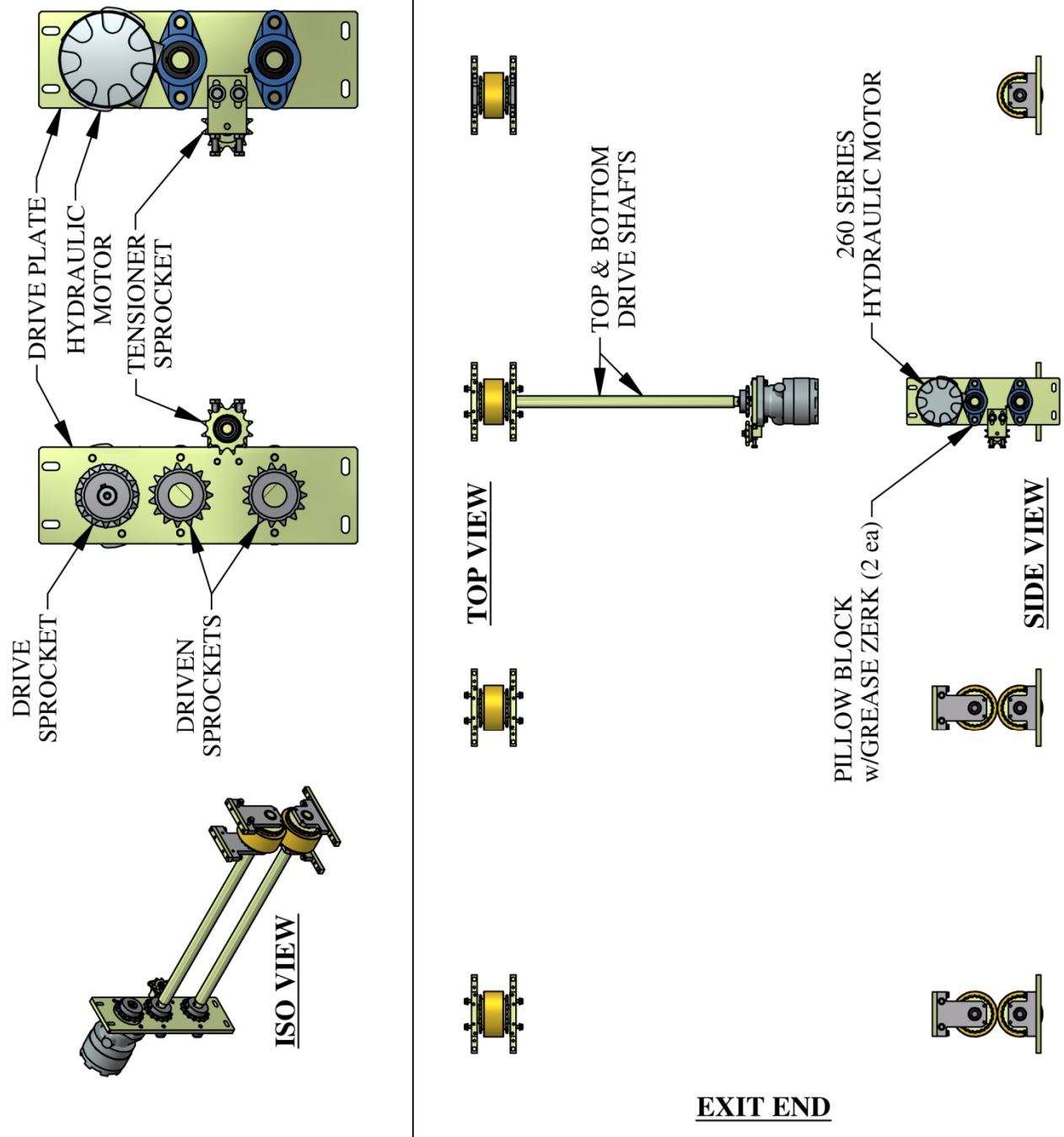
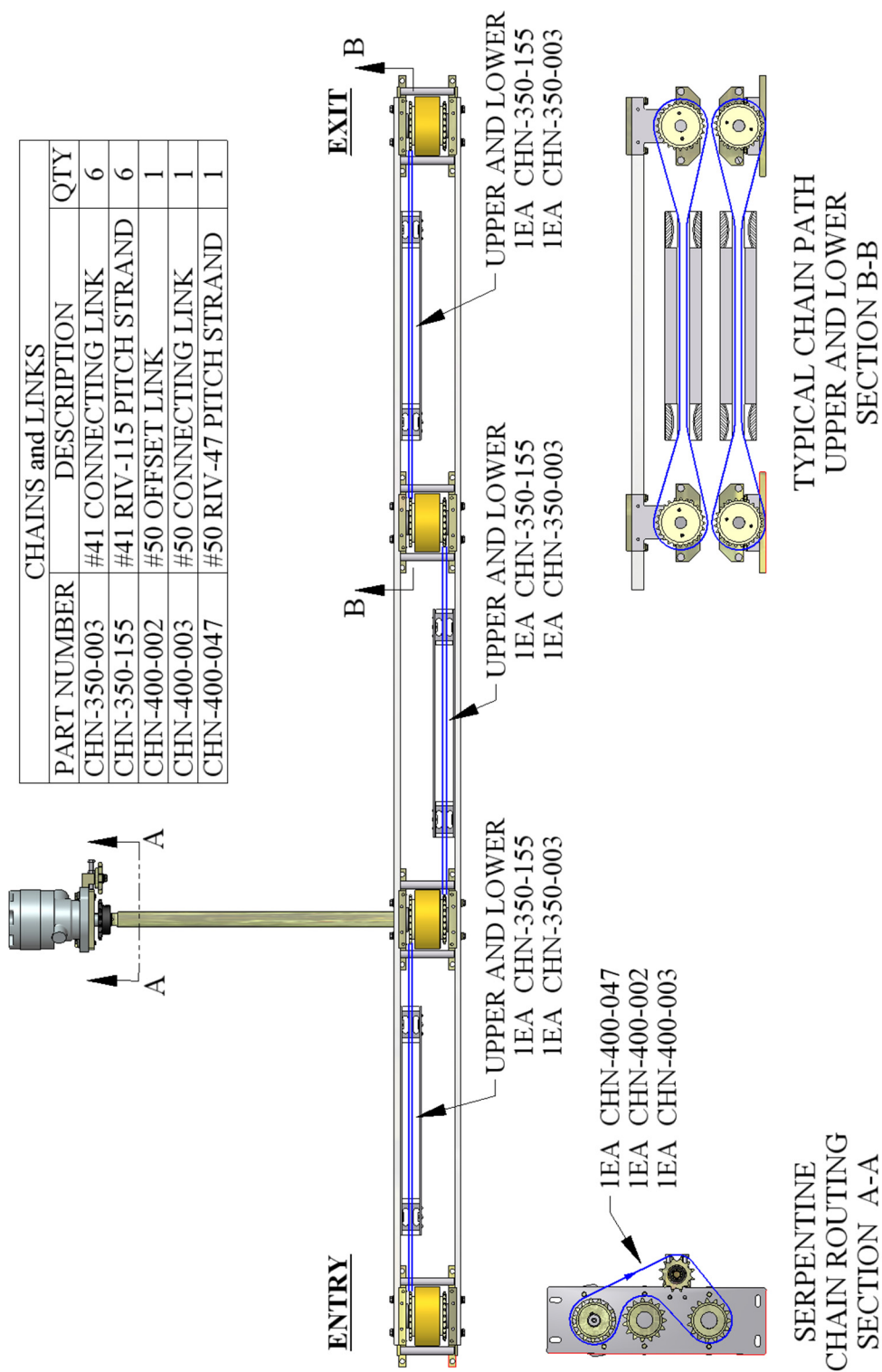


Figure 16: Sprockets and Shafts

## CHAPTER 8

# DRIVE SYSTEM



**Figure 17: Upper and Lower Chains**

CHAPTER 9  
**SHEAR ASSEMBLY**

## **SHEAR ASSEMBLY**

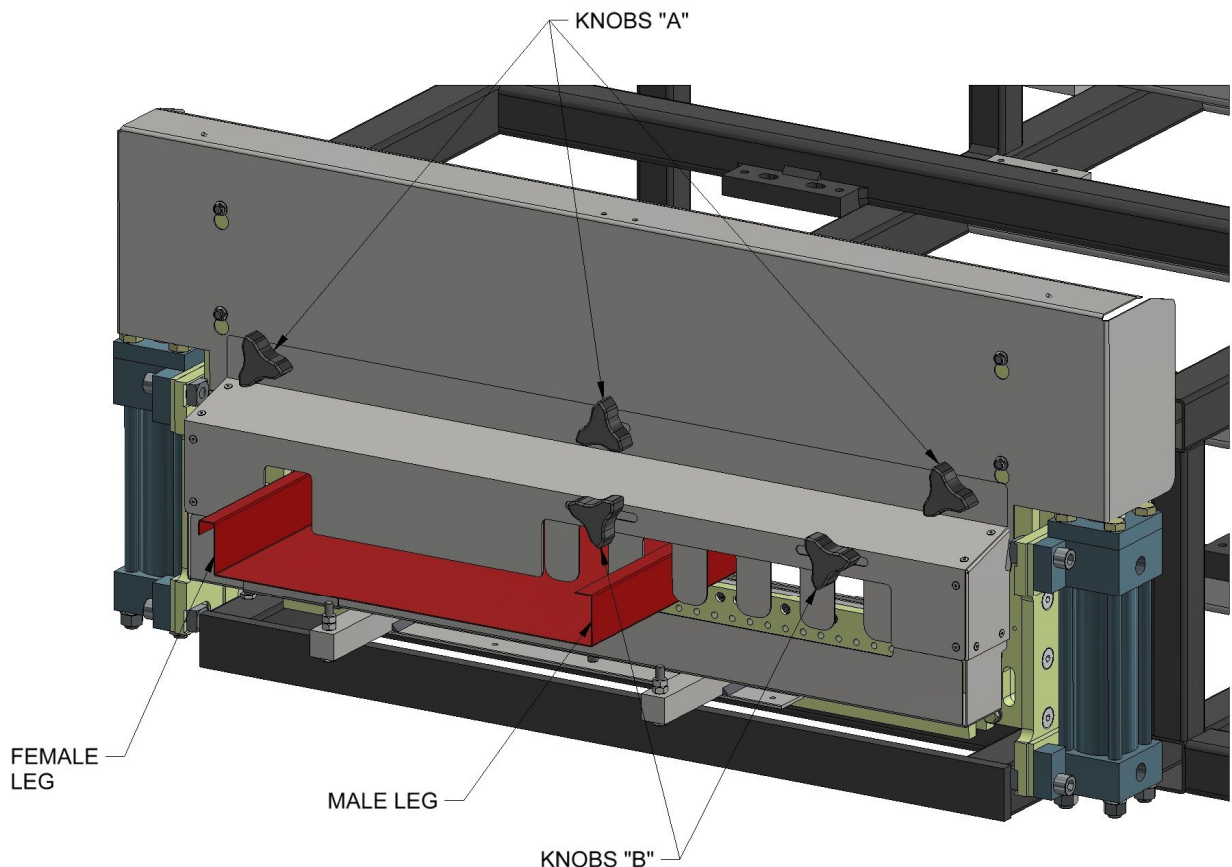
### **SHEAR GUARD**

The shear is extremely dangerous and can cause serious bodily injury or death. For this reason, the machine is provided with a guard to prevent the operator from reaching into the shear. **It is very important that the guard remain in place at all times when the machine is in operation.** The guard should only be removed for maintenance and adjustment of the shear when power is removed from the machine.

#### **Shear Guard Adjustment:**

When changing the panel width or profile it may be necessary to adjust the position of the openings in the shear guard to allow the panel to exit the machine. Follow the procedure below and refer to Figure 18.

1. Jog the material forward until the panel is about 1-2" away from the shear guard.
2. Look through the opening for the female leg. If it looks like the panel will hit the guard, loosen Knobs "A" and adjust the shear guard as needed. Re-tighten Knobs "A".
3. Look through the openings for the male leg. If it looks like the panel will hit the guard, loosen Knobs "B" and adjust the sliding plate until one of the openings lines up with the male leg. Re-tighten Knobs "B".



**Figure 18: Shear Guard Adjustment**

## CHAPTER 9

# SHEAR ASSEMBLY

### OPERATION

Push the **SHEAR DOWN** button to activate the shear cycle and cut material. **IN CASE OF AN EMERGENCY:** Push the **SHEAR UP** button during the down cycle to immediately send the shear up to the home position.

The shear is electrically activated and hydraulically driven.

The two Top Limit Switches and single Bottom Limit Switch control the cycle of the shear.

The Top Limit Switches electronically lock out the drive system when the shear is in motion.

The Bottom Limit Switch sends the shear back up once the bottom of the stroke is reached.

### SHEAR ADJUSTMENTS

Bottom Shear Dies (Figure 19 thru Figure 24)

1. Bottom dies should be adjusted 1/32" below the bottom corners of the panel. Loosen the (2) "A" bolts on the left and right Front Vertical Plates. Loosen the (2) lock nuts on the (2) Height Adjustment bolts "B".
2. Tightening bolts "B" will lower the shear, and loosening them will raise it. Adjust each side as needed to properly set the bottom dies to the correct spacing from the bottom corners of the panel.
3. After adjustments have been made, tighten (2) "A" bolts and (2) Lock Nuts on Height Adjustment Bolts "B".

### CHANGING AND ADJUSTING SHEAR DIES AND BLADES

The Entry and Exit Shear Dies are specific to each roller set and they may need to be changed when changing profiles. The Dies must be adjusted to the proper distance from the vertical legs of the panel. The outside vertical leg of the male and female Entry Dies should be approximately 1/32" away from the outside of the vertical legs of the panel. The Exit Dies should be slightly to the outside of the male and female Entry Dies so that after a cut is made, the panel does not hang up on the Exit Dies. Follow the procedure below to make the adjustments.

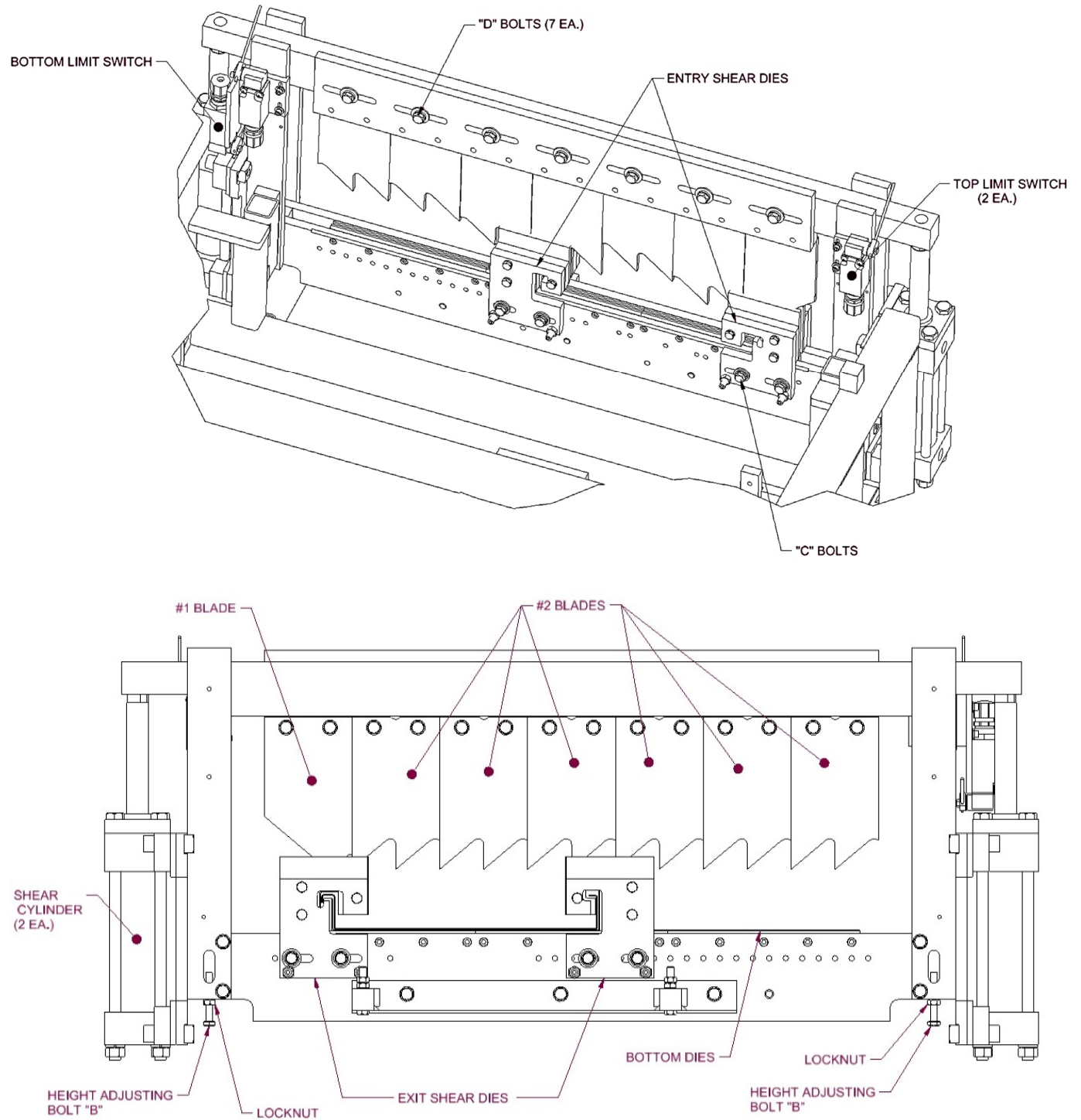
1. Run material through the machine until it is about 6 inches away from the shear, then shut off the machine and disconnect the power.
2. Sight down the legs of the panel to find the approximate location to install the **Entry Shear Dies**. Hold them in place with the "C" bolts but do not tighten them yet.
3. Start up the machine and carefully jog the material forward while looking through the dies. If it looks like the panel will hit the dies, shut off the machine and disconnect the power, then adjust the dies as necessary so the panel goes through cleanly.
4. Continue jogging the panel forward until it is about an inch or two past the shear dies, then shut off the machine and disconnect power.
5. Adjust the **Entry Shear Dies** until they are about 1/32" away from the outside of the vertical leg of the panel, as shown in the figure for your panel found on page 32. Tighten the "C" bolts.
6. If the Entry Shear Die has a **Mandrel**, it should be positioned as shown in the figure for your panel found on Page 32. If necessary loosen the "E" bolts and adjust the Mandrels. Retighten the "E" bolts.

CHAPTER 9  
**SHEAR ASSEMBLY**

7. Install the **Exit Shear Dies** and adjust them so they are about 1/32" to the outboard of the Entry Shear Dies, as shown in the figure for your panel found on pages 32-34. Tighten the "C" bolts.
8. Adjust the **Mandrel** on the exit Shear Die as needed, if it has one.
9. In order to cut properly, the **Top Blades** need to be positioned so that one of the #2 Blade tips is just to the inside of the male leg, as shown in Figure 19-Figure 24, and also the tip of the #1 blade is positioned to the inside of the female leg, as shown in Figure 21-Figure 24. The rake or angle of the blades should cut in a scissor action outward against the legs. If necessary, loosen the 7 "D" bolts and move the Top Blades left or right to get them in the correct position. Re-tighten the bolts.
10. Start the machine and shear off a piece of panel about 12 inches long, then jog the material forward a few inches. Make sure the panel is not scraping on the shear dies, and inspect the quality of the cut on both sides. If any corrections need to be made, shut off the machine and disconnect the power, then adjust the shear dies as needed.

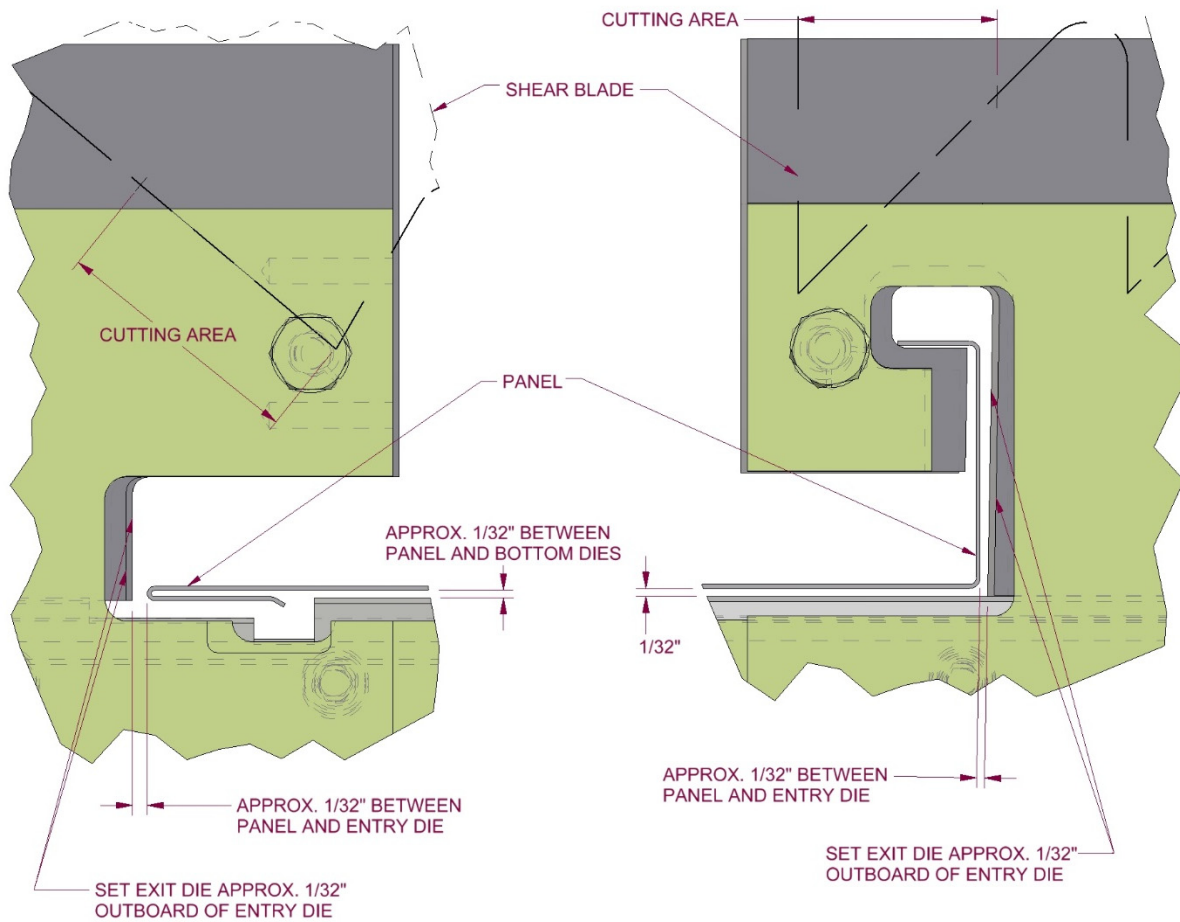
## CHAPTER 9

# SHEAR ASSEMBLY



**Figure 19: Entry/Exit Views**

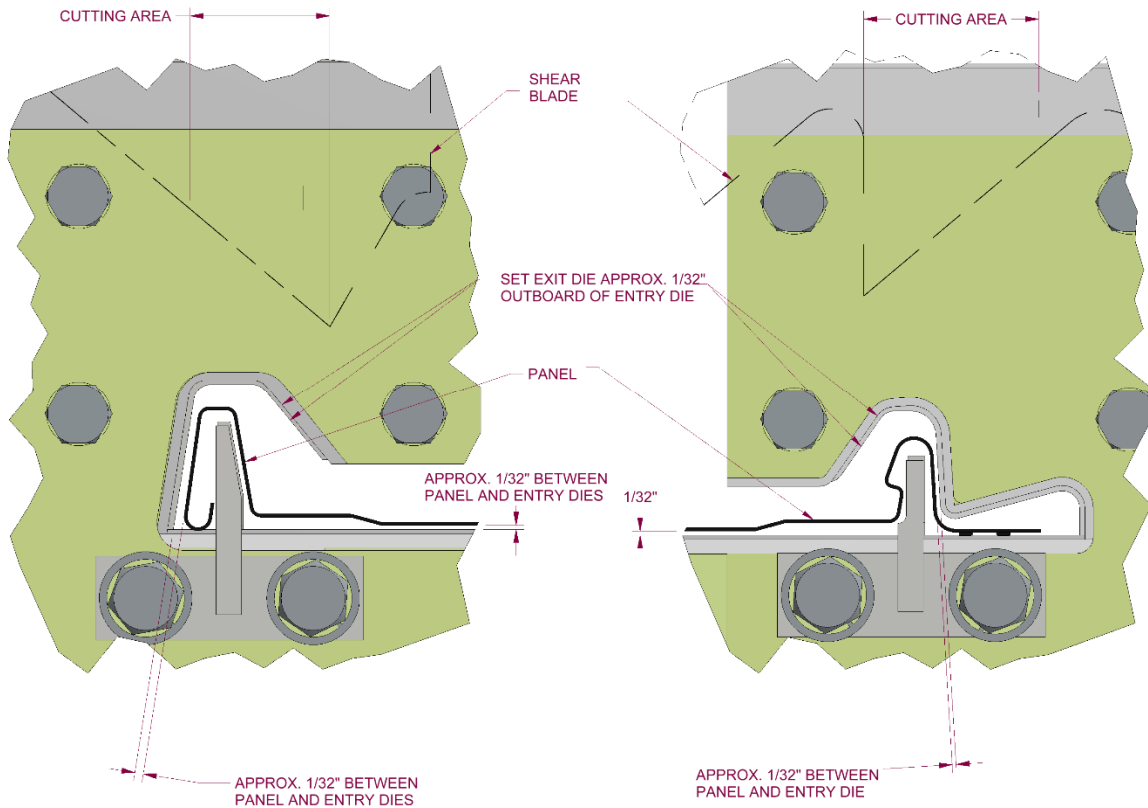
CHAPTER 9  
**SHEAR ASSEMBLY**



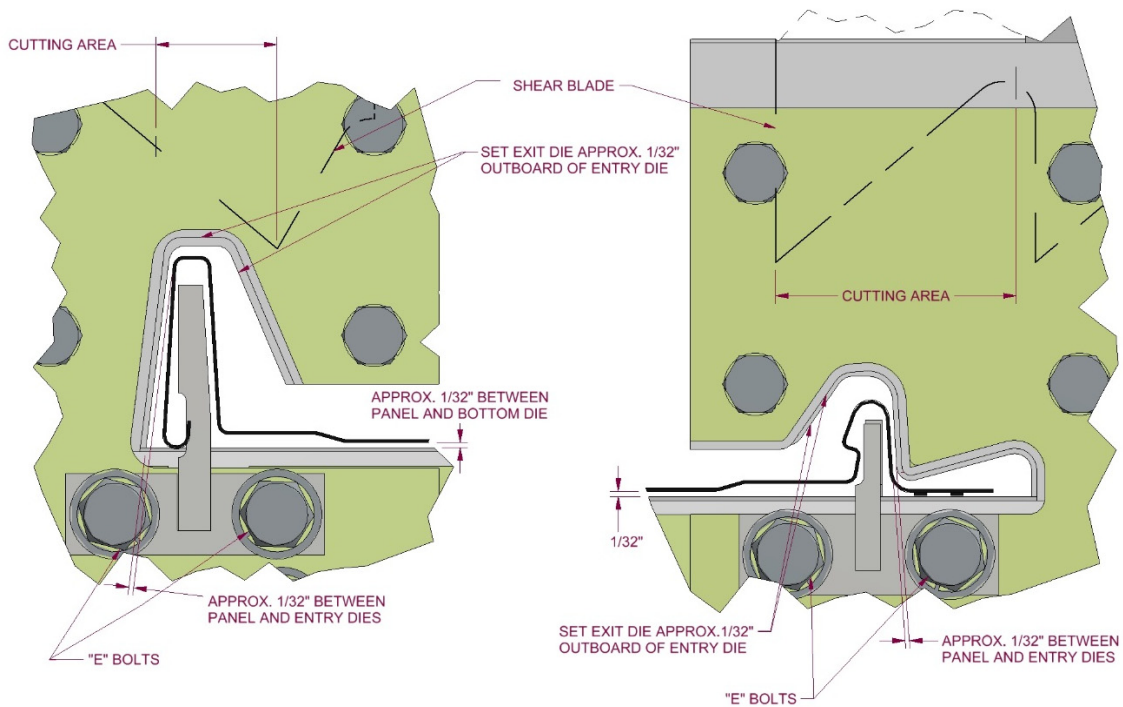
**Figure 20: BP100/150 Shear Dies**

## CHAPTER 9

# SHEAR ASSEMBLY



**Figure 21: FF100 Shear Dies**

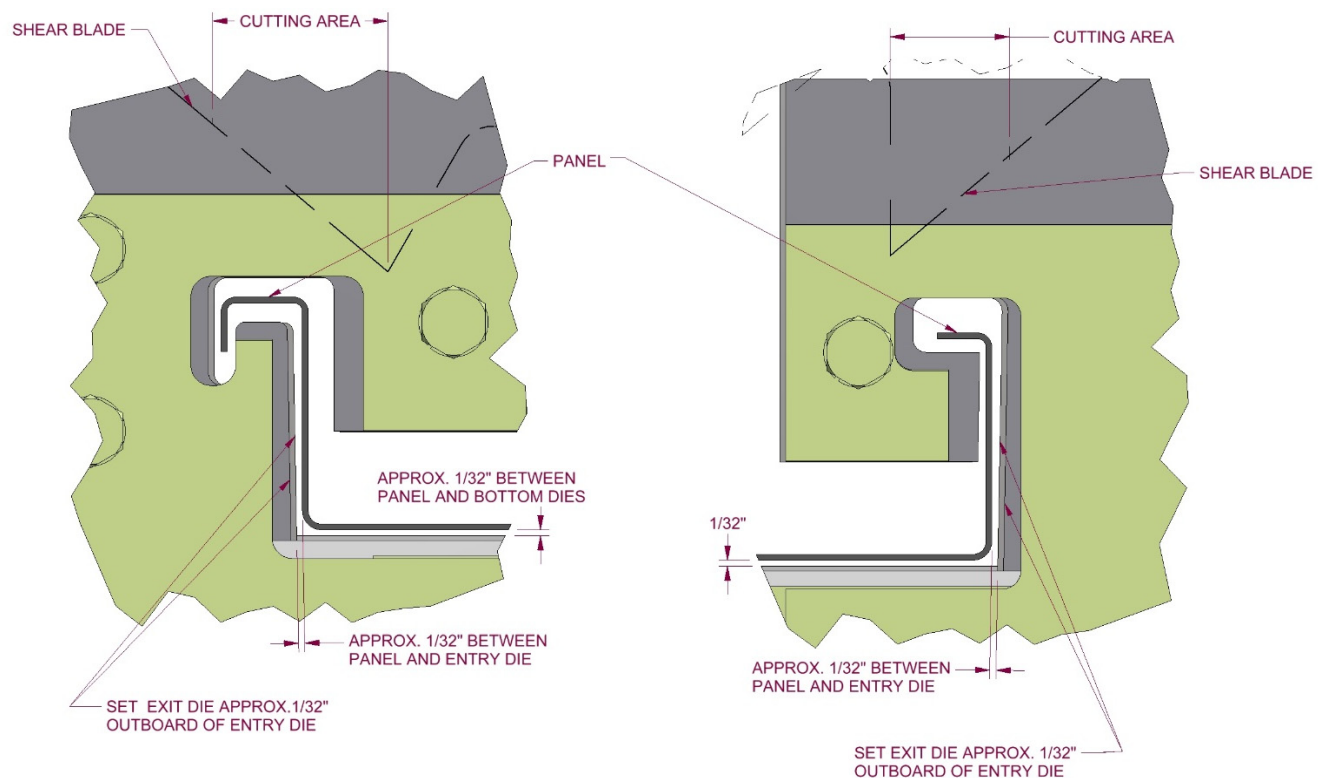


**Figure 22: FF150 Shear Dies**

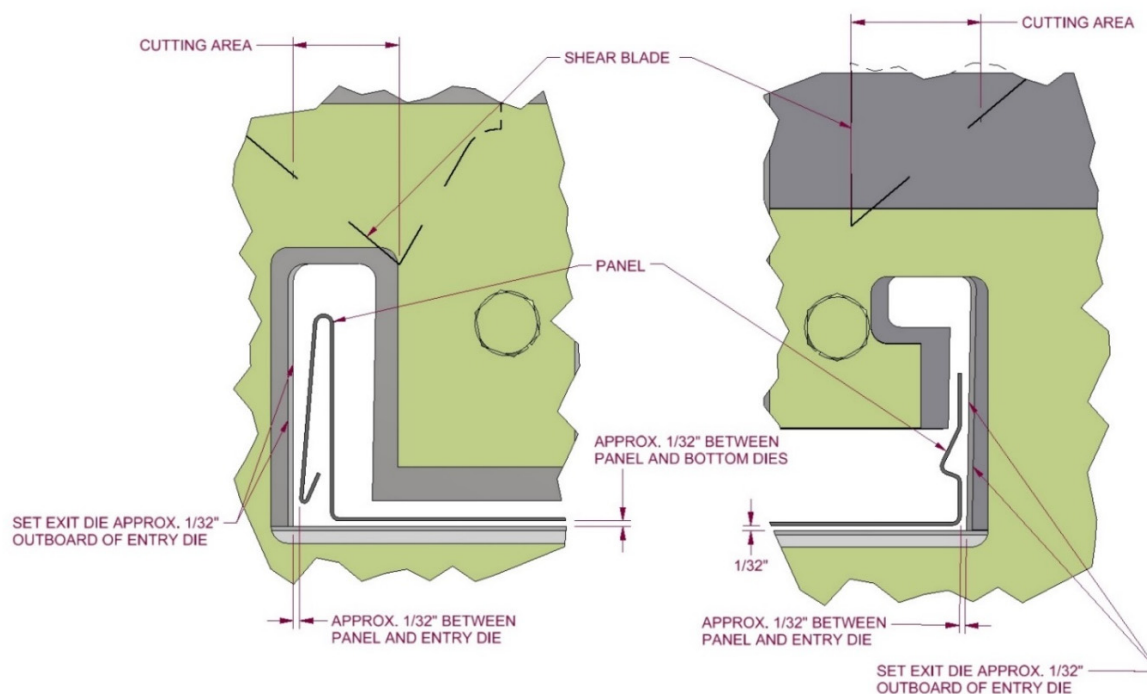


## CHAPTER 9

# SHEAR ASSEMBLY



**Figure 23: SS100 / 150 Shear Dies**



**Figure 24: SS450 Shear Dies**

CHAPTER 9  
**SHEAR ASSEMBLY**

**MAINTENANCE**

1. Clean and lubricate the Top Blades, Bottom Dies, and Male/ Female dies at least once a day during normal use, or whenever cutting surfaces look dry. Proper lubrication is essential to clean cuts, rust prevention and longevity.

Super Lube - Multi-Purpose Synthetic Dri Film Aerosol Lubricant with Syncolon (PTFE)

Catalog No. 11016

11 oz. Aerosol Can

Available from:

**MSC Supply at 1-800-645-7270**

CHAPTER 10  
**BEAD ROLLER ASSEMBLY**

## **BEAD ROLLER ASSEMBLY**

(Figure 25 on page 37)

1. The Bead Roller assembly is located behind the shear and is accessed by removing top cover #3. These rollers can be engaged or disengaged as needed and can also be moved left or right to accommodate different panel widths.
2. The bottom bead forming roller should be set 1 /32" above the drive roller to ensure proper entry into the shear. If adjustment is necessary, loosen the four frame mount bolts "B", and lock nuts on the two vertical adjustment bolts "A". Raise or lower the roller assembly by using the vertical adjustment bolts "A" to obtain the proper height. Then re-tighten the mount bolts and lock nuts on the two adjustment screws "A".
3. Next loosen the eccentric shaft lock down screw "C". Place a 5/32" Allen Wrench in the small hole at the end of the eccentric shaft, and rotate the top roller up until it clears the bottom roller. Loosen the two top and two bottom slide lock down screws "D". Bring the panel material up to the rollers but not past them.

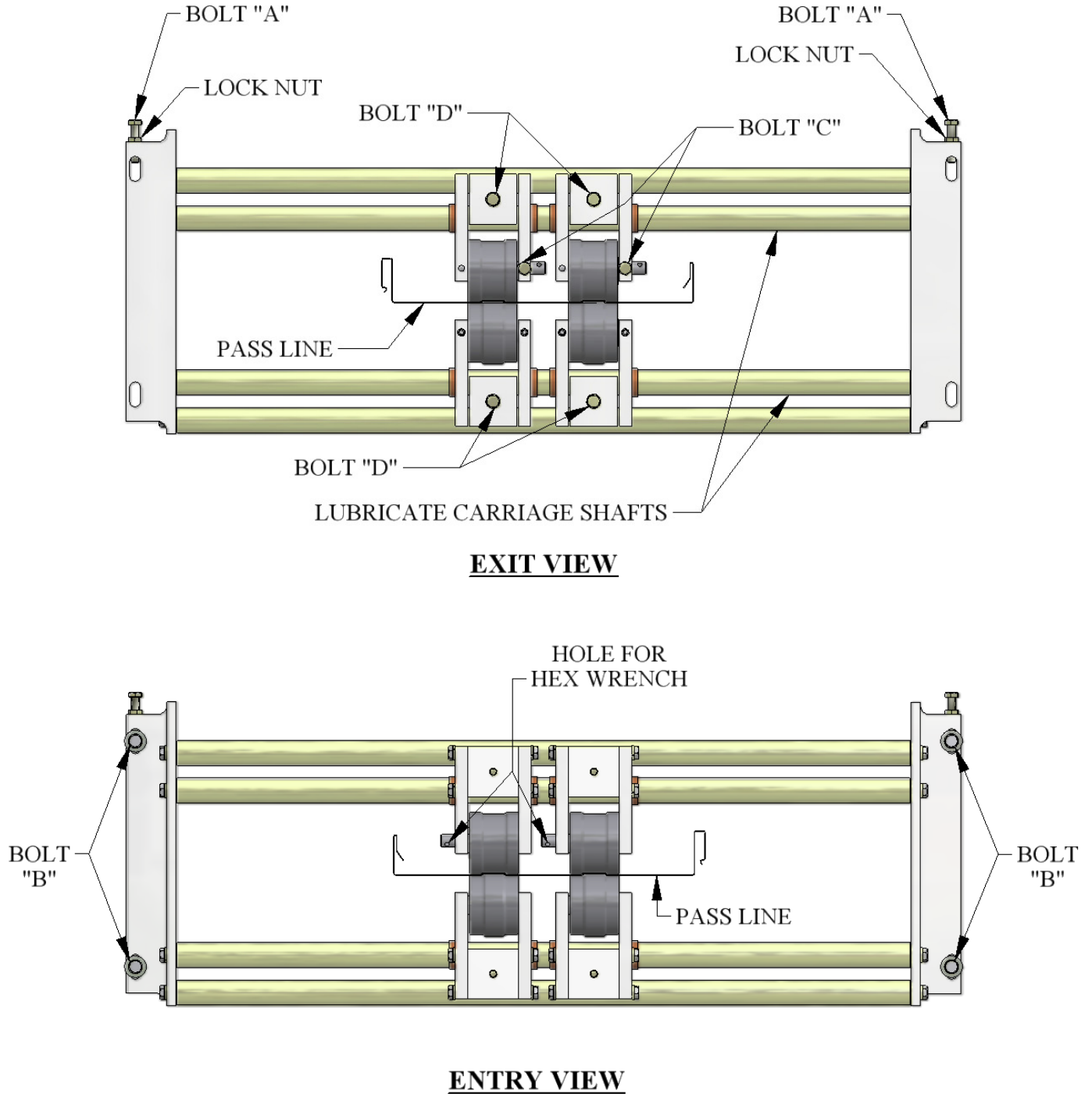
**SHUT OFF THE MACHINE AND DISCONNECT THE POWER BEFORE CONTINUING.**

4. Locate the bottom rollers to the desired position by sliding the assembly on the bottom slide bars. Tighten the bottom slide lock-down screws "D". Restart the machine and back up the panel until access is gained to the top slide lock-down screws.

**SHUT OFF THE MACHINE AND DISCONNECT THE POWER BEFORE CONTINUING.**

5. Loosen the top slide lock-down screws, and slide them into position so the top roller is directly over the bottom roller. Tighten the top slide lock-down screws "D". Next rotate the eccentric shaft down to the desired bead depth. **DO NOT** go below .045" minimum clearance; excessive bead depth will distort the panel. Re-tighten screws "C".
6. Keep slide bars lightly greased to allow bead or striation assemblies to slide smoothly.

CHAPTER 10  
**BEAD ROLLER ASSEMBLY**



**Figure 25: Bead Roller Assembly**

CHAPTER 10  
**BEAD ROLLER ASSEMBLY**

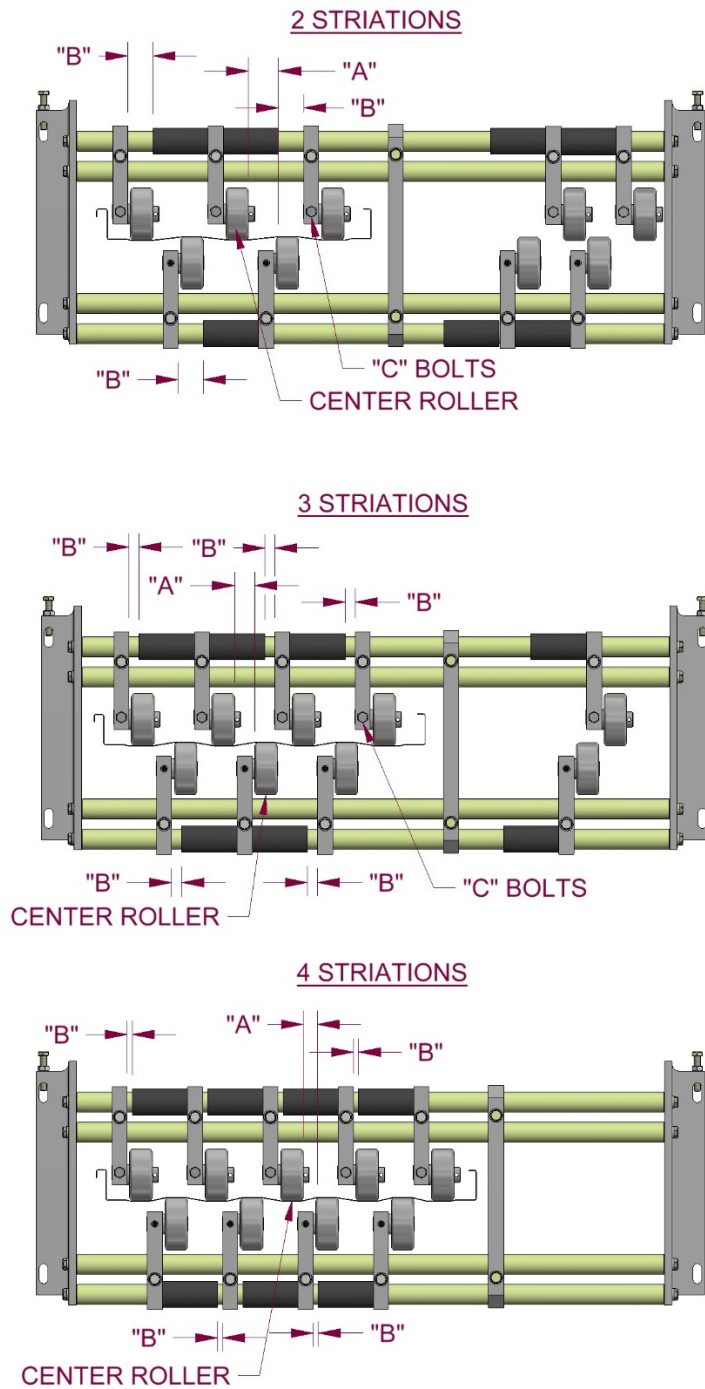
## **STRIATION ROLLER ADJUSTMENT**

(Figure 26 on page 39)

1. Jog the panel through the machine and stop a few inches before the striation rollers.
2. Measure the width of the panel and mark the center with a marker.
3. Look up your panel width in the striation spacing chart to determine if you need 2, 3, or 4 striations.
4. Referring to Figure 26, align the middle of the center roller with the center mark on the panel.
5. Position the remaining striation rollers as shown in Figure 26, using the “A” and “B” dimensions found in the striation chart.
6. Position the Stiffener Bars an inch or two outside of the panel as shown.
7. Jog the panel a few inches past the striation rollers and check if the striation appearance is acceptable. If not, adjust the positions of the striation rollers as needed. The striation depth can be adjusted by loosening the “C” bolts and rotating the eccentric shafts.

# CHAPTER 10

## **BEAD ROLLER ASSEMBLY**



2 STRIATIONS		
Panel Coverage	"A" Dimension	"B" Dimension
12" to 12-15/16"	1-1/8"	3/4"
13" to 13-15/16"	1-3/8"	1-1/4"
3 STRIATIONS		
Panel Coverage	"A" Dimension	"B" Dimension
14" to 14-11/16"	3/4"	0"
14-3/4" to 15-7/16"	7/8"	1/4"
15-1/2" to 16-3/16"	1"	1/2"
16-1/4" to 16-15/16"	1-1/8"	3/4"
17" to 17-11/16"	1-1/4"	1"
4 STRIATIONS		
Panel Coverage	"A" Dimension	"B" Dimension
17-1/2" to 18-7/16"	3/4"	0"
18-1/2" to 19-7/16"	7/8"	1/4"
19-1/2" to 20-7/16"	1"	1/2"
20-1/2" to 21-7/16"	1-1/8"	3/4"
21-1/2" to 22-7/16"	1-1/4"	1"
22-1/2" to 23-7/16"	1-3/8"	1-1/4"
23-1/2" to 24"	1-1/2"	1-1/2"

**Figure 26: Striation Spacing Chart**

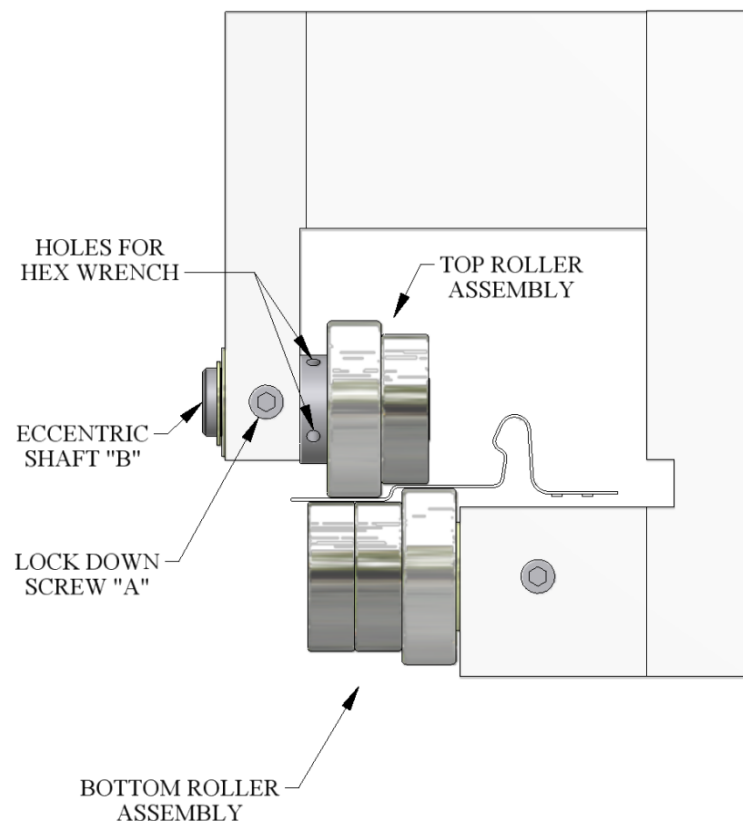
CHAPTER 11  
**CLIP RELIEF ROLLER ASSEMBLY**

## CLIP RELIEF ROLLER ASSEMBLY

(Figure 27 on page 40)

1. Clip Relief Rollers provide a raised area next to the male and female legs of the panel. This helps hide the clip and screws used in installation. The rollers can be engaged or disengaged as needed.
2. Find the Tooling Rail Sheet corresponding to the profile installed in the machine (Figure 47 to Figure 56 on pages 63 to 72.) Note the location of the clip relief assemblies on the left and right tooling rails, and locate them on the tooling set in the machine.
3. To engage the clip relief rollers loosen lock down screw "A" and insert a 1/8" Allen Wrench into the small hole on the top eccentric shaft "B".
4. Rotate the eccentric shaft to engage or disengage the top roller assembly from the bottom roller assembly. Adjust both left and right bead assemblies to the desired depth using a feeler gage. Recommended factory setting is 0.080 inches gap between top and bottom rollers.

**NOTE:** The FF100 and FF150 profiles must always have the clip relief rollers engaged for proper male/female lock to occur.



**Figure 27: Clip Relief Roller Assembly**

CHAPTER 12  
**ENTRY DRUM ASSEMBLY**

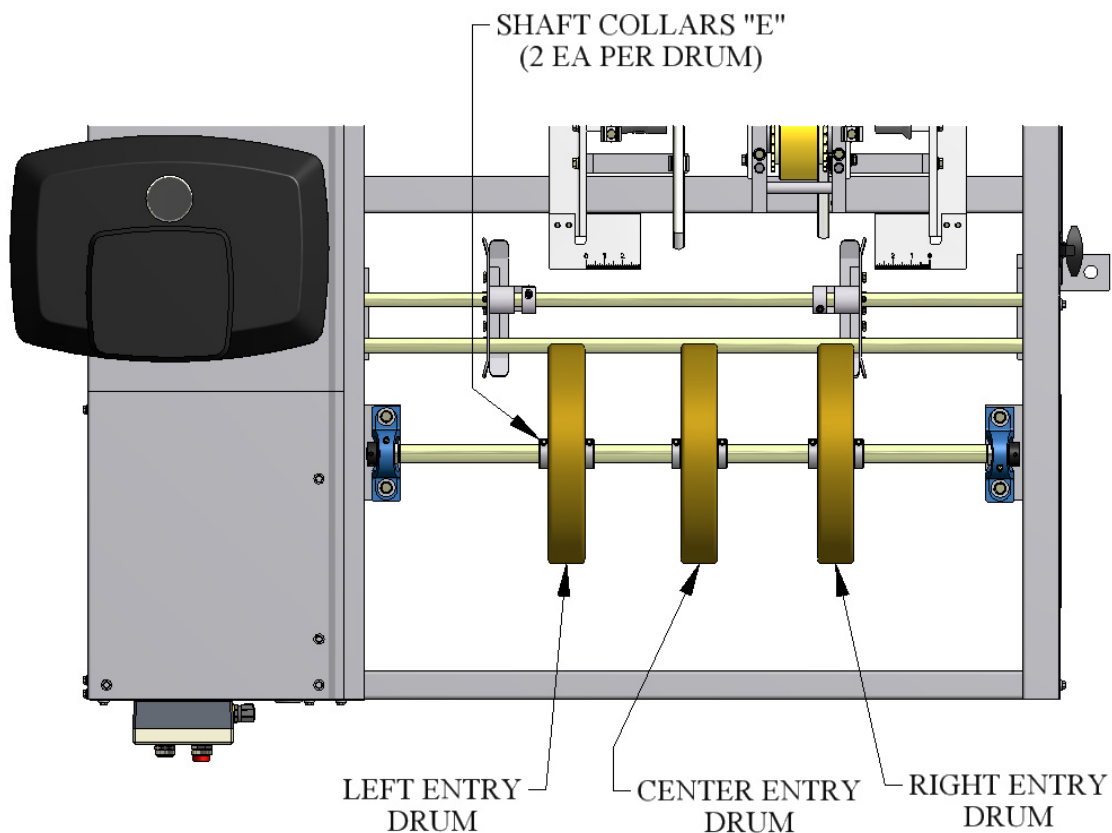
## ENTRY DRUM ASSEMBLY

(Figure 28 on page 41)

The Entry Drum Assembly is necessary when feeding coil off of the optional DR1/ Dual Overhead Reel Stand. It allows the material to be routed around the drums to get the painted side of the coil on the top as it enters the machine. The Entry Drums need to be adjusted whenever a width change is made.

To adjust the entry drums:

1. Using a 3/16" Allen Wrench, loosen the four Shaft Collars "E", on either side of Left Entry Drum and Center Entry Drum.
2. Slide the Left Entry Drum over until it is lined up with left edge of the new coil and align the Center Entry Drum equally spaced from the Left and Right Entry Drums.
3. Slide the four Shaft Collars "E" against the sides of the drums and lock them into place.
4. If changing profiles, it may be necessary to move all three drums using the same procedure described above.



**Figure 28: Entry Drum**



CHAPTER 13

**WIDTH AND PROFILE CHANGE PROCEDURE**

## **WIDTH AND PROFILE CHANGE PROCEDURE**

The profile changeover procedure consists of removing the tooling assemblies and shear dies from the machine, replacing them with another set and realigning the rails and shear dies. A change in coil width can also be done at this time. The following procedure will be a guide through this process.

**CAUTION:** Always make sure the machine is shut down prior to making any adjustments. **DO NOT reach through the opening of the shear while the machine is running. EVER!** To do so could result in serious injury.

### ***Tooling Changeover***

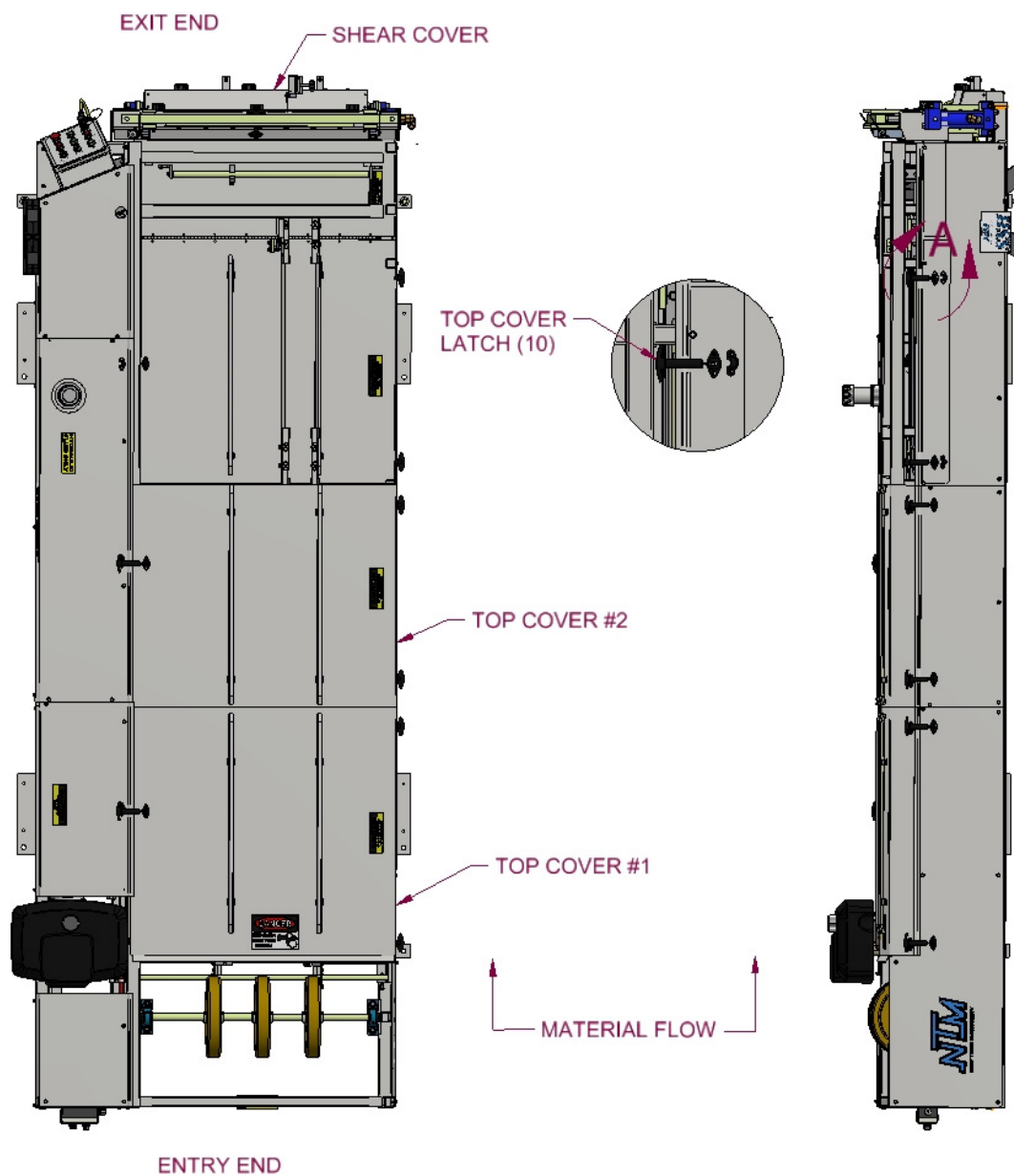
Figure 29 and Figure 30 on pages 43 and 44)

Tooling rails are stamped with an "L" or "R" for installation on the left or right side, and with a profile number and sequence number. For example a rail stamped SS4-#1 R would be the number one right tooling rail for the SS450 profile.

1. Disengage top cover latches on #1, #2, and #3 top covers. Remove and set aside.
2. Remove Shear Cover and set aside.
3. Locate and remove the "A" bolts on the left tooling rail #1. Remove rail and set it aside.
4. Using the same procedure as above remove the remaining left and right tooling rails and set them aside for storage.
5. Locate #1 right tooling rail of the profile to be installed.
6. Carefully lower it into the machine and set it on the right carriage slide #1.
7. Align the tooling mounting holes "A" and start one "A" bolt into threaded hole beneath. Snug this bolt enough to hold tooling in place but **DO NOT TIGHTEN**. Align second hole and start bolt into threaded hole beneath.
8. Tighten "A" bolts.
9. Locate remaining right tooling rails #2, #3 etc. and install in the same manner as above.
10. Repeat the above procedures on the left side of the machine until all tooling rails are installed.

CHAPTER 13

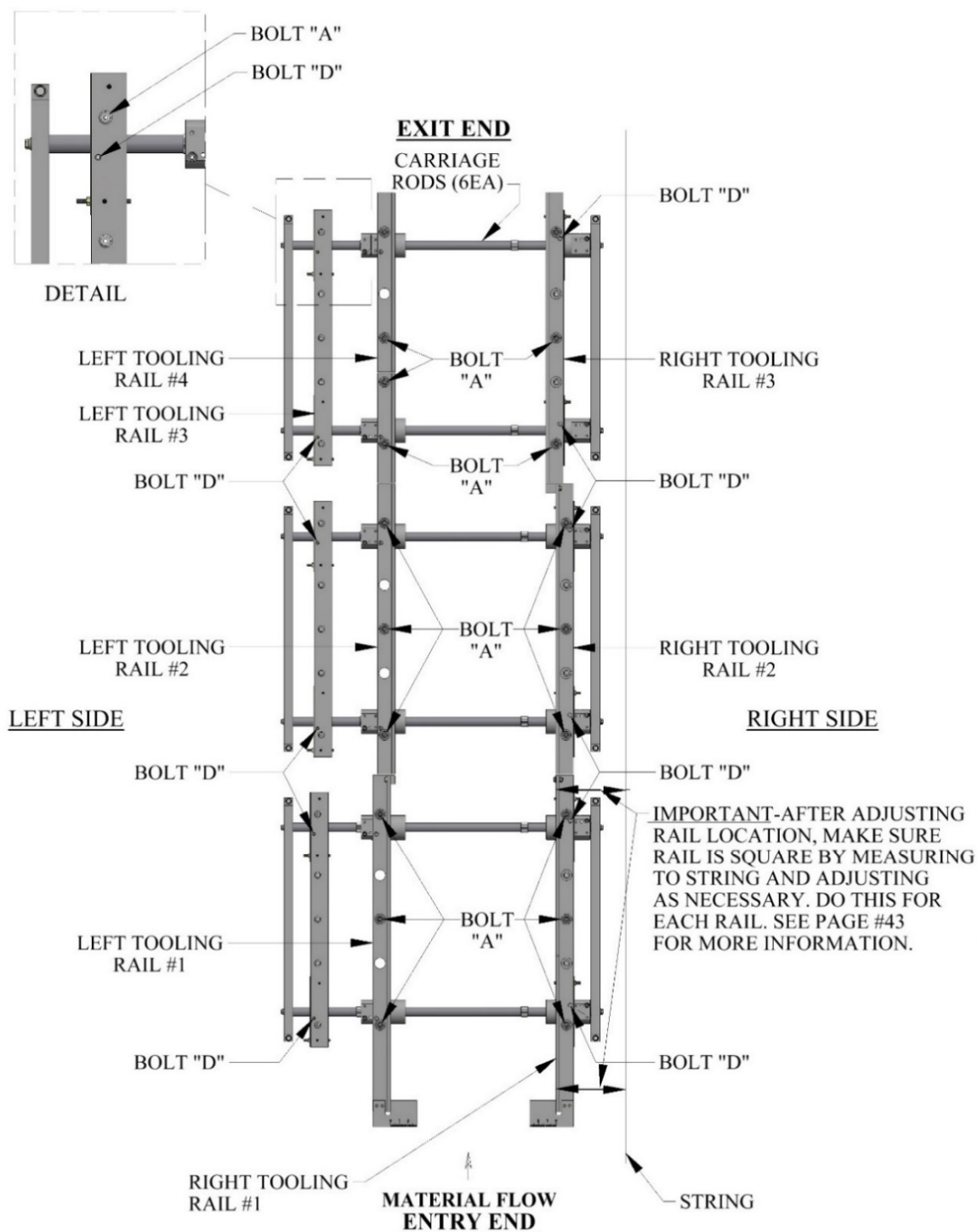
## WIDTH AND PROFILE CHANGE PROCEDURE



**Figure 29: Remove Covers**

# CHAPTER 13

## WIDTH AND PROFILE CHANGE PROCEDURE



**Figure 30: Tooling Rail Detail**

## CHAPTER 13

# **WIDTH AND PROFILE CHANGE PROCEDURE**

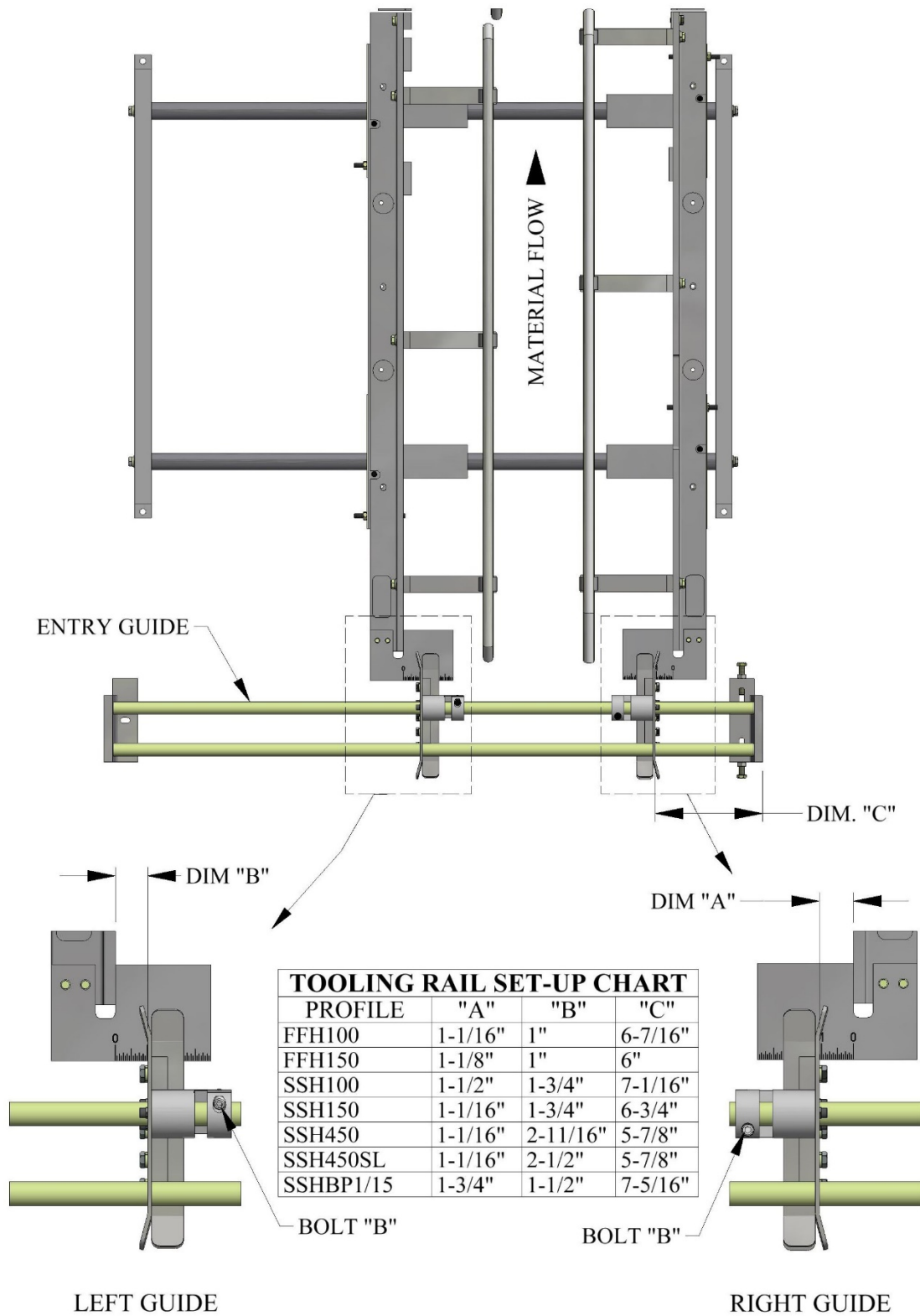
### ***Entry Guide Adjustment***

(Figure 31 on page 46)

The entry guides are used to set the material to the correct position in relation to the forming rollers of the machine. They also hold the material and feed it straight into the machine. If the entry guides are not set correctly the material will not feed into the machine properly.

1. To align, loosen the “B” Bolt on the Right Entry Guide. Slide the entry guide to the left or right until DIM “C” is in the correct position that corresponds to the desired leg configuration as noted on Figure 31.
2. Retighten the “B” bolt.
3. Loosen bolt “B” on the Left Entry Guide.
4. Cut a 12” long piece of gage material from the coil that will be used.
5. Slide gage material between the left and right entry guides. Slide the Left Entry Guide to the left or right to accept the new coil width.
6. Make sure that the coil is captured snugly between the entry guides and re-tighten the “B” bolt.

CHAPTER 13  
**WIDTH AND PROFILE CHANGE PROCEDURE**



**Figure 31: Entry Guide**

## CHAPTER 13

# **WIDTH AND PROFILE CHANGE PROCEDURE**

### ***Tooling Rail to Entry Guide Alignment***

(Figure 30 and Figure 31 on pages 44 and 46)

The #1 tooling rails are adjusted in and out on the slide carriages to line up to the entry guides. The #2 tooling rails are adjusted in and out to line up with the #1 tooling rails. Finally, the #3 tooling rails are adjusted in and out to line up with the #2 tooling rails. If the tooling is not adjusted correctly the material will not be fed into the forming rollers properly.

1. Loosen the two slide lock bolts “D” on right carriage slide # 1.
2. Move Right Carriage Slide # 1 into position using the side of the right entry guide and the scale on the marker plate to set the correct “A” dimension as shown on corresponding tooling rail set up chart.
3. Measure the distance from the tooling rail to the string at each end of the rail to check for squareness. If the measurements are not the same, adjust the end of the rail closest to the shear until the rail is square. Tighten the “D” bolts. Repeat the above procedure for the left carriage slide #1 using the correct “B” dimension on the tooling rail set up chart.
4. Align the # 2 and #3 Left and Right Carriage Slides by loosening the two “D” slide lock bolts on each rail. If there is a spacer bolted to the side of the previous rail, align the carriage rail flush to the spacer. If not, align the rails flush with each other. Repeat Step #3 above for each tooling rail.
5. Proceed with each rail in succession from #1 to # 2 to #3, right and left as stated above.

### ***Shear Changeover***

(Figure 19 on page 31)

There are four shear die holders (female entry and exit and male entry and exit). The dies must be removed, replaced and re-aligned utilizing the shear dies for the new profile.

1. Locate and remove two “C” bolts on exit female die holder. Set die holder aside.
2. Repeat the above procedure for entry female die holder and male exit/ entry die holders. Set all four-die holders aside to storage.
3. Locate the four die holders corresponding to the profile that was just installed into the machine. Install the new die holders following the directions in the Shear Assembly section starting on page 28.

### ***Loading Machine with Material***

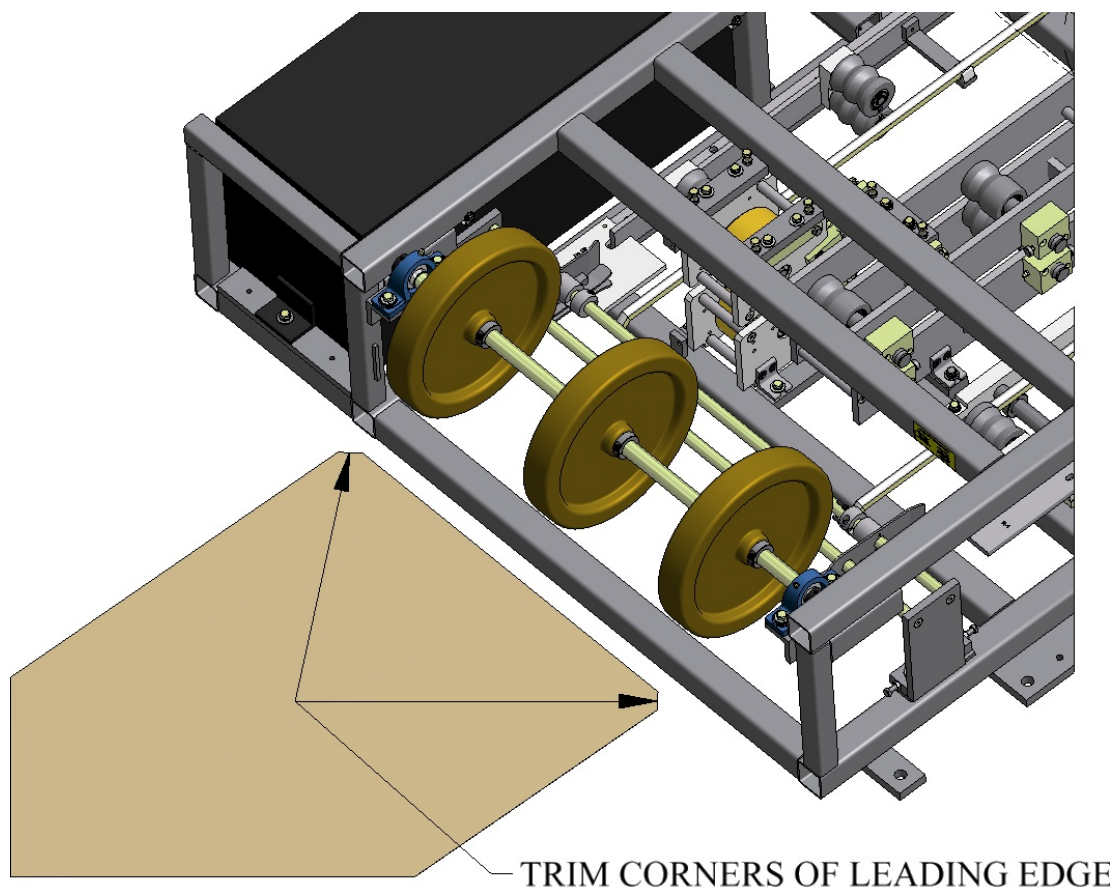
1. Load material onto the Expandable Arbor and align it to the correct position using the chart on Figure 8 on page 15.

Note: Also see REEL STANDS, REELS AND EXPANDABLE ARBORS on page 14 for more information.

2. Load the reeled coil onto the machine using a fork lift or other rated lifting device. Making sure the tail of the coil goes over the top and points toward the shear end of the machine. See coil routing diagram on Figure 11 on page 20.
3. Cut a 1” triangle off of the 2 leading corners of the coil and feed it into the entry guides as shown in Figure 32 on page 48.

CHAPTER 13

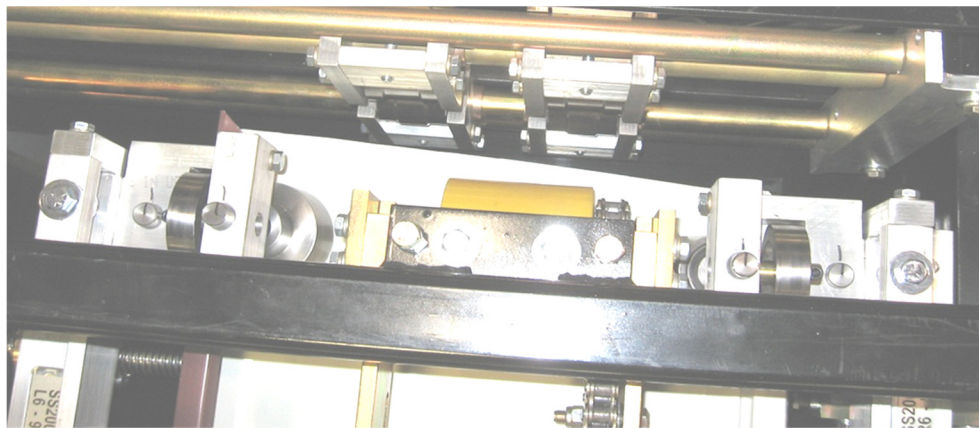
## WIDTH AND PROFILE CHANGE PROCEDURE



**Figure 32: Feeding Material into Entry Guides**

4. Start the machine and use the Jog button on the manual control box or computer controller to jog the material through the machine 6 to 8 inches at a time until it exits the last forming stations and the leading edge is about 1" from the Bead Roller Assembly (if equipped).

***SHUT THE MACHINE DOWN BEFORE PROCEEDING.***



**Figure 33: Material Entering Bead Rollers**

CHAPTER 13

**WIDTH AND PROFILE CHANGE PROCEDURE**

***Bead Rollers (if equipped)***

(Figure 25 on page 37)

If the machine is equipped with a bead roller option and the panel requires beads to be on the panel, use the procedures in the Bead and Striation Assembly chapter starting on page 36.



CHAPTER 14

**RUN OUT TABLES AND REMOTE LIMIT SWITCH**

## **RUN OUT TABLES AND REMOTE LIMIT SWITCH**

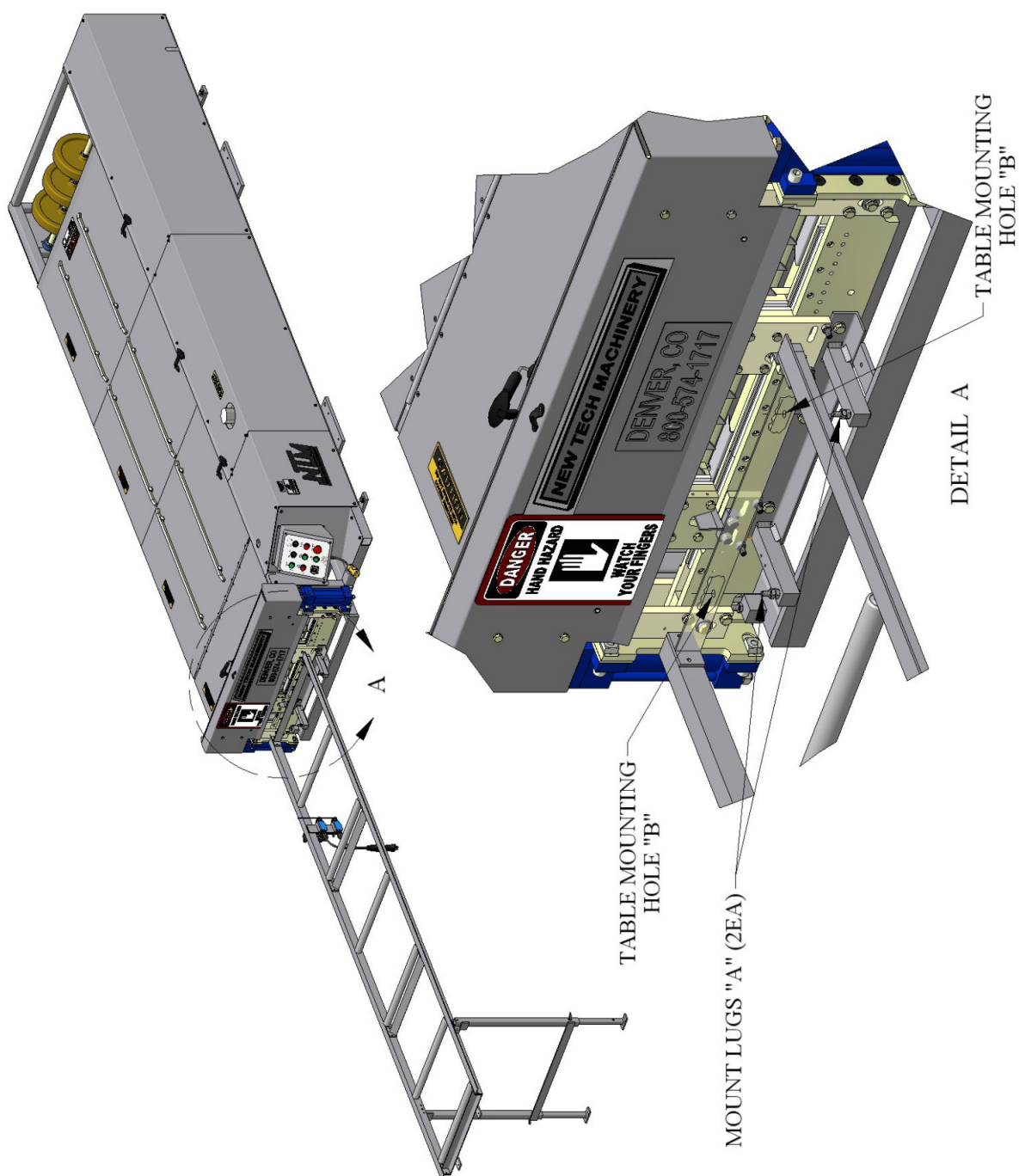
(Figure 34 and Figure 35 on pages 50 and 52)

The Run-Out Table attaches to the Exit End of the Shear assembly, and is used to support the panel as it exits the machine. It is available in 10 ft. long sections that fasten together, and have adjustable legs so they can be set to the correct height. The Remote Limit Switch (Figure 5 on page 12) is designed to be used with the run out tables for controlling panel length.

1. Set the first Run-Out Table on its side and in front of the machine with the leg assembly away from the shear.
2. Open the leg assembly and set it upright on the ground.
3. Lift the attachment end of the table and drop it over the 2 threaded bolts on the Shear Run-Out Table Bracket.
4. Loosen the 2 knob-handles on the leg assembly and allow the legs to fall free. Sight the height of the table on the left and right side adjusting it level to the machine using the knob-handles to lock the legs in place. See Figure 35 on page 52 for correct and incorrect set up and details.
5. Repeat the above procedures for each succeeding table and attach it to the bracket on the end of the previous table.

CHAPTER 14

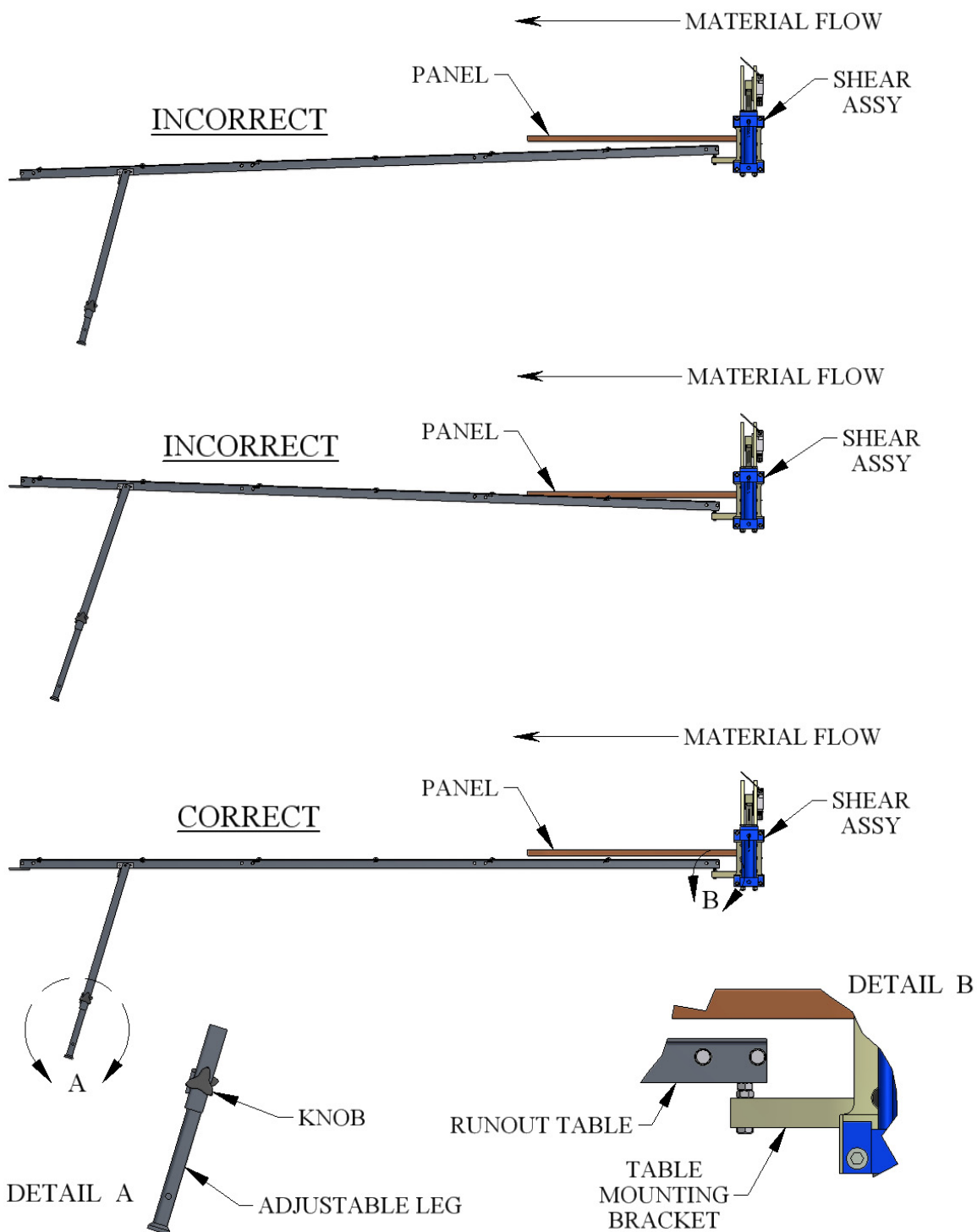
## RUN OUT TABLES AND REMOTE LIMIT SWITCH



**Figure 34: Runout Table**

CHAPTER 14

## RUN OUT TABLES AND REMOTE LIMIT SWITCH



**Figure 35: Run Out Table Setup**

## CHAPTER 15

# QUICK CHANGE POWER PAC

## QUICK CHANGE POWER PAC (QCPP)

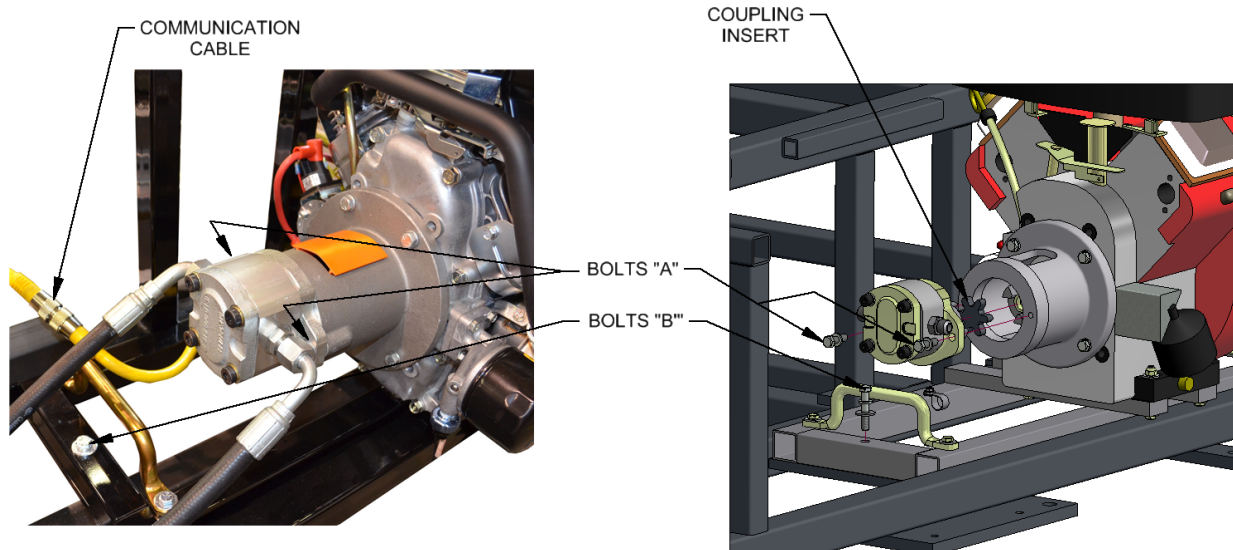
(Figure 36 and on page 53)

The Quick Change Power Pac allows the machine to change from one power source to another very quickly. For example, it is useful to run the machine at the jobsite with a gas engine and use it in a factory or indoor setting with an electric motor as well. **It requires two people to lift the Power Pac out of and into the machine.** To change the power pac see below.

### POWER PAC REMOVAL

1. Remove the screws holding the Left Cover on the machine. Set cover aside.
2. Separate the Male /Female Connectors of the Main Communication Cable by unscrewing them from each other.
3. Using a 9/16" wrench, remove the two 3/8" bolts ("A") connecting the hydraulic pump to the motor-pump adapter and set aside for later use.
4. Un-couple the pump from the adapter as well as the coupling insert found in the pump adapter.
5. Using a 9/16" wrench, remove the two 3/8" bolts ("B") connecting the Power Pac to the machine frame.
6. Using the two handles, lift the Quick Change Power Pac out of the machine and set it aside.

Install new Power Pac in reverse order.



**Figure 36: Quick Change Power Pac Fasteners**

CHAPTER 16  
**TROUBLESHOOTING**

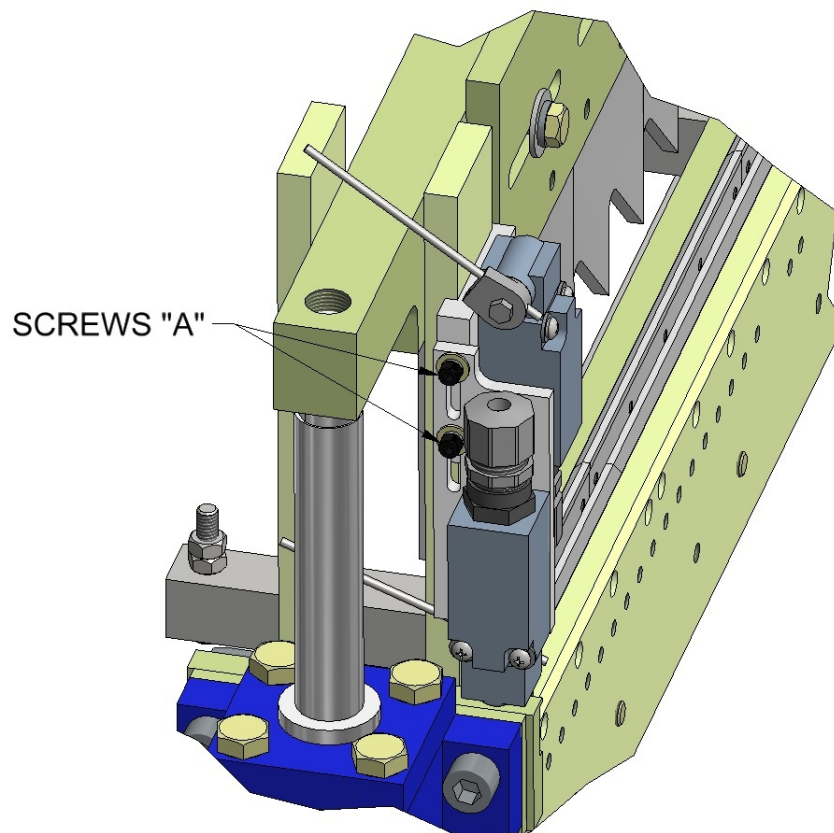
## TROUBLESHOOTING

The hydraulic system operates the Shear and Drive assemblies. They are interfaced together and electronically activated. The hydraulic system pressure is factory set at 2000 psi and should not be changed. Some of the common problems that occur and their solutions follow below.

1. **Shear travels to the bottom of the stroke and does not return to the top of the stroke. The hydraulic system can be heard laboring and pushing the Red Shear Up Button does not return it to the top of stroke.**

SOLUTION for machines manufactured before April 2013 with an adjustable pressure switch: Adjust the pressure switch (Figure 13 on page 23) by turning the silver knurled sleeve **counterclockwise** until the shear goes up. **Note:** If the sleeve is turned too far CCW, problem #2 below will be shown on the next cut made.

SOLUTION for machines manufactured after April 2013 with an adjustable limit switch: Loosen Screws "A" (Figure 37). Press Shear Down. While the hydraulic system is laboring and the shear is stuck in the lower position, raise the Bottom of Stroke Limit switch until it clicks and the Shear goes up. Tighten Screws "A". **Note:** If the limit switch is adjusted too far up, problem #2, below, will be seen on the next cut made.



**Figure 37: Bottom of Stroke Limit Switch**

## CHAPTER 16

# **TROUBLESHOOTING**

- 2. Shear travels to the bottom of the stroke and returns to the top of the stroke without cutting the panel completely through.**

**SOLUTION:** For machines manufactured before April 2013 with an adjustable pressure switch: Press and hold the Green Shear Down Button until the panel is cut off. Remove the cut panel and jog material out 2 or 3 inches past the shear. Adjust the pressure switch (Figure 13 on page 23) by turning the silver knurled sleeve “A” clockwise 1/8 of a turn. Press the Shear Down Button again. Check to see if the panel is cut off completely. If not, repeat this procedure until the cut is made with one stroke of the shear. **Note:** If the sleeve is turned too far CW, problem #1 above will be shown on the next cut made.

**SOLUTION:** For machines manufactured after April 2013 with an adjustable limit switch: Loosen Screws “A” (Figure 37). Lower the Bottom of Stroke Limit Switch. Tighten Screws “A”. Press the Shear Down button and repeat adjustment if necessary. **Note:** If the limit switch is adjusted too far down, problem #1, above, will be seen on the next cut made.

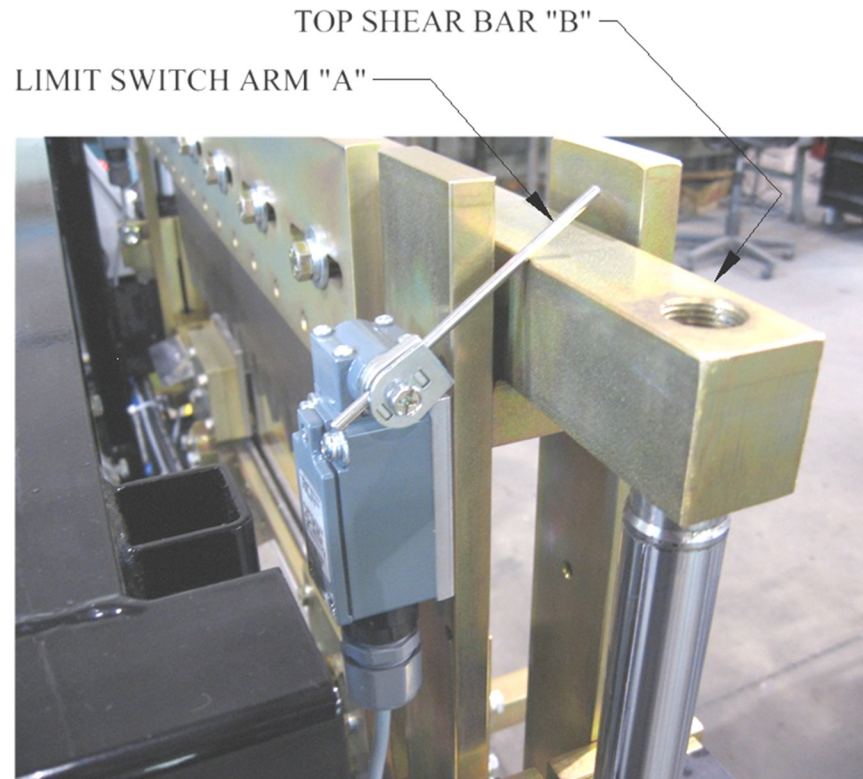
- 3. Shear is at the top of the stroke, the hydraulic system can be heard laboring and the next panel cannot be run.**

**SOLUTION:** Remove the Shear Cover. Note the 2 Limit Switch Arms “A” (Figure 38 on page 56). Lift the arms one at a time. If one of them stops the hydraulic system laboring then that Limit Switch arm needs to be adjusted. If neither of them stops it, lift both arms at the same time to see if it stops. If it does then both arms need adjusting.

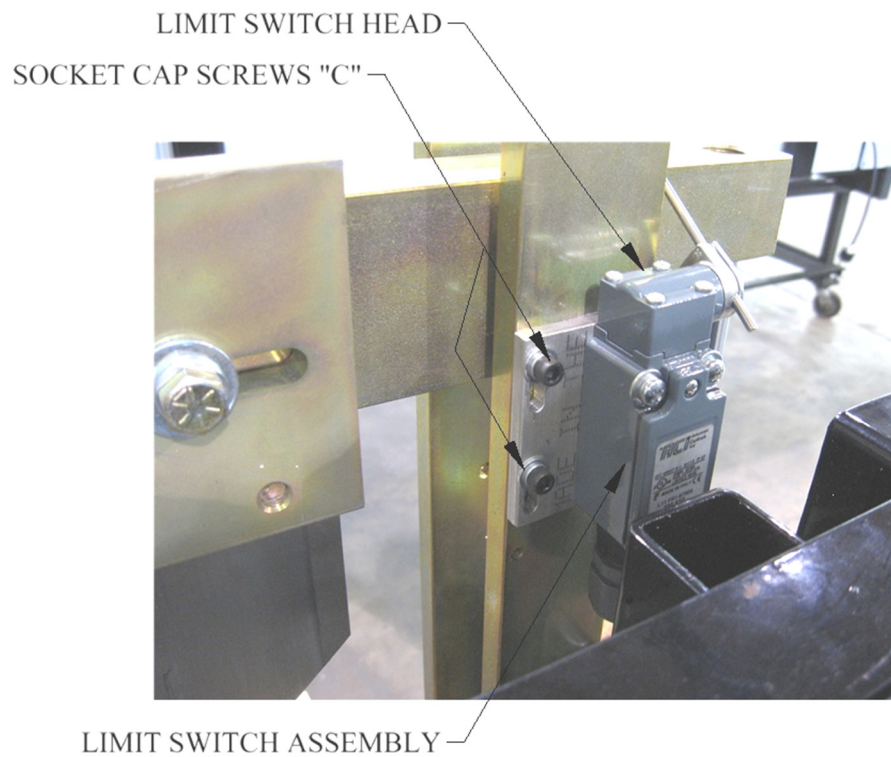
**ADJUSTMENT:** Loosen socket cap screws “C” (Figure 39 on page 56). Move limit switch down until a click is heard. Tighten socket cap screws “C”. Adjust one or both sides as required from test above. Start the engine. If the adjustment/adjustments were done correctly, the hydraulic system should no longer be laboring and the next panel can be run.



CHAPTER 16  
**TROUBLESHOOTING**



***Figure 38: Top of Stroke Limit Switch***



***Figure 39: Limit Switch Adjustment Screws***

CHAPTER 16  
**TROUBLESHOOTING**

- 4. After making a cut, the male or female leg of the next panel gets caught on the exit shear die and damages the panel.**

SOLUTION: This problem normally shows up after making a roller system/shear die change. The entry dies both male and female should be as close to the vertical leg of the panel as possible without touching. Once this is achieved, the exit die should be set just outside the vertical leg of the entry die so that as the fresh cut edge of the panel passes by the exit die it doesn't get caught. (Figure 19: Entry/Exit Views on page 31)

- 5. The male and or female leg gets crushed when shearing.**

SOLUTION #1: Check the Shear Blades directly over the male and female legs to make sure that the points of the blades are in the correct position (Figure 19 to Figure 24 on pages 31 and 34).

SOLUTION #2: Make sure that the shear blades and dies are well lubricated on both sides with the proper lubricant (See GENERAL MAINTENANCE on page 5).

- 6. Manual Control Panel buttons do not work.**

SOLUTION #1: Check fuse inside of Manual Control Box. Replace if blown with a 10-amp fuse (Figure 6 on page 13).

SOLUTION #2: If the machine is powered by a gas engine, check the condition of the battery. The control system requires 12 volts to operate properly. Replace or charge battery as required.

SOLUTION #3: Make sure that the Main Control Cable (Figure 4 on page 11) is properly connected to the connector on the front of the Control Panel



CHAPTER 17

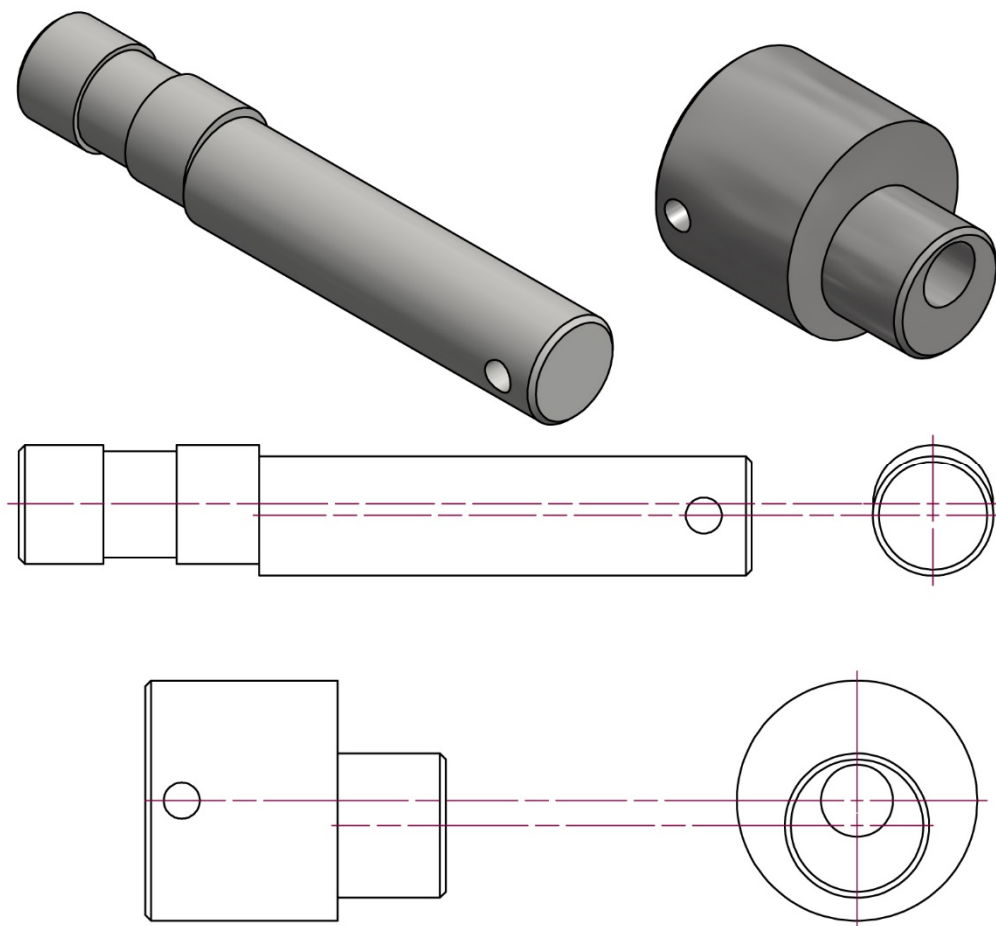
## **PROFILE ADJUSTMENTS**

### **PROFILE ADJUSTMENTS**

Care must be taken when making any adjustments to the roller systems. A slight change can have dramatic effects.

### **ECCENTRIC SHAFTS**

Every roller set is equipped with eccentric shafts on selected sub stations for adjusting the angles and gaps in the panel.

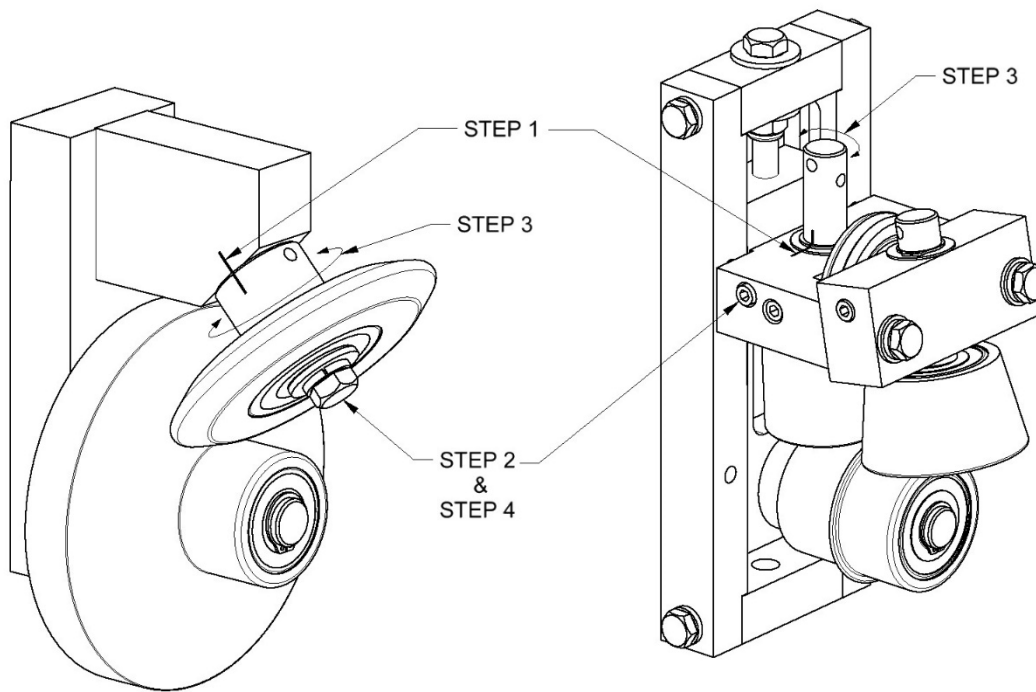


**Figure 40: Eccentric Shafts**

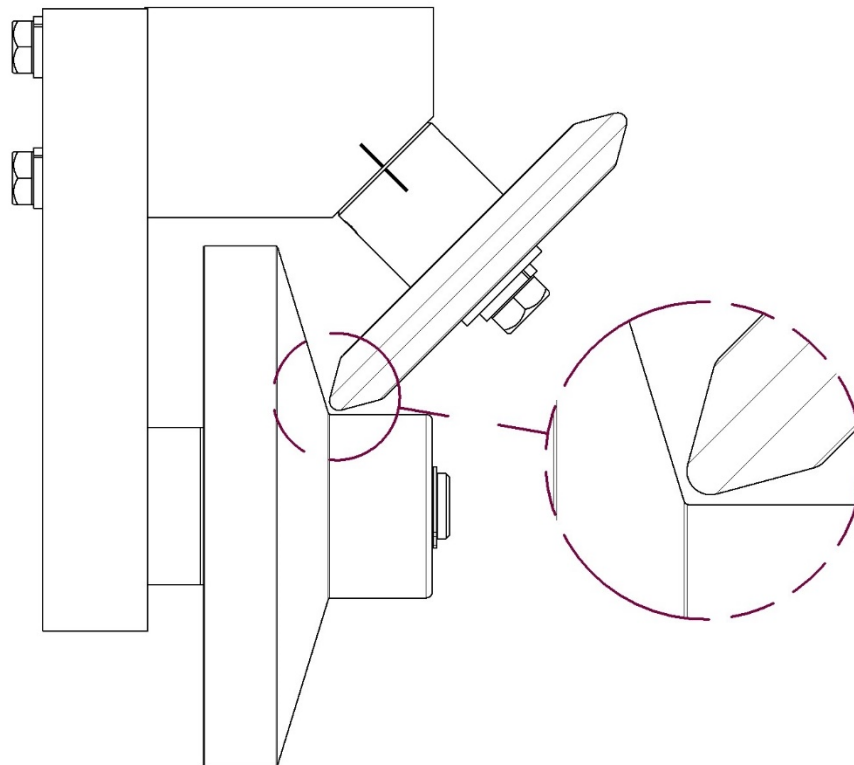
To adjust an eccentric shaft, use the following procedure:

1. Mark the current orientation of the shaft to serve as a starting point of reference and a point to return to if the adjustment yields negative results.
2. Loosen the set screw and/or bolt that holds the shaft in place.
3. Rotate the shaft to the desired angle. (See Figure 42 - Figure 44).
4. Re-tighten the set screw and/or bolt.

CHAPTER 17  
**PROFILE ADJUSTMENTS**



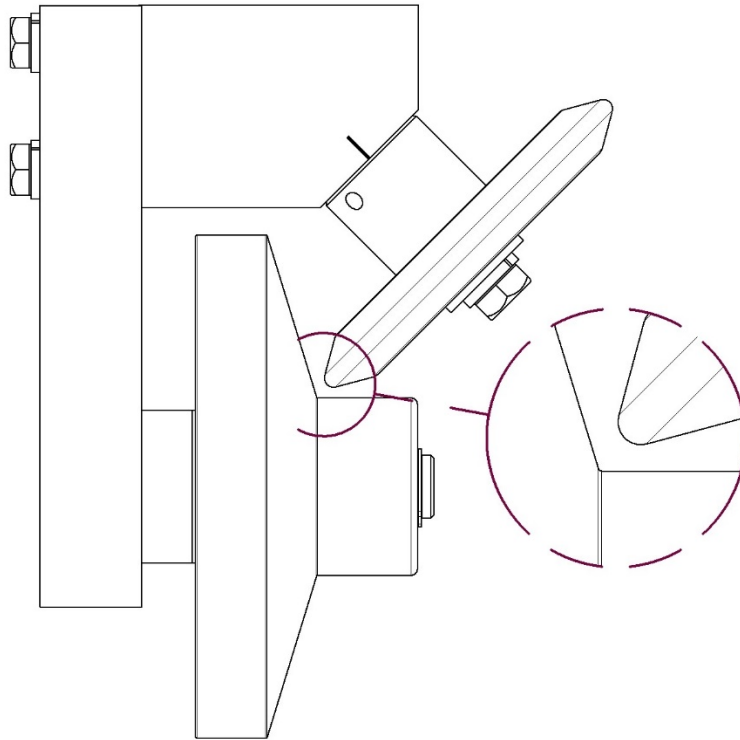
**Figure 41: Adjusting Eccentric Shafts**



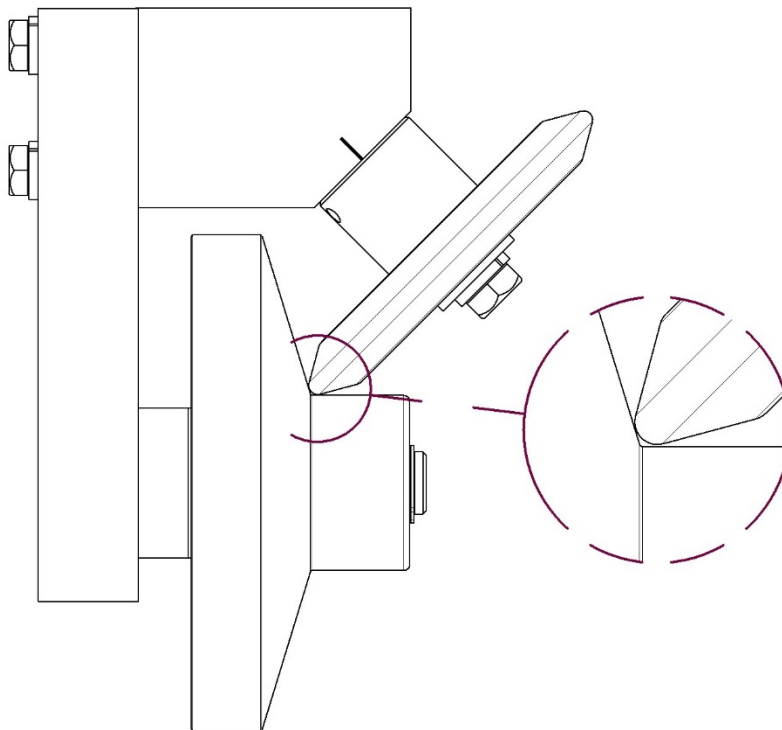
**Figure 42: Eccentric Shaft Proper Adjustment**

CHAPTER 17

**PROFILE ADJUSTMENTS**



**Figure 43: Eccentric Shaft Too Loose**



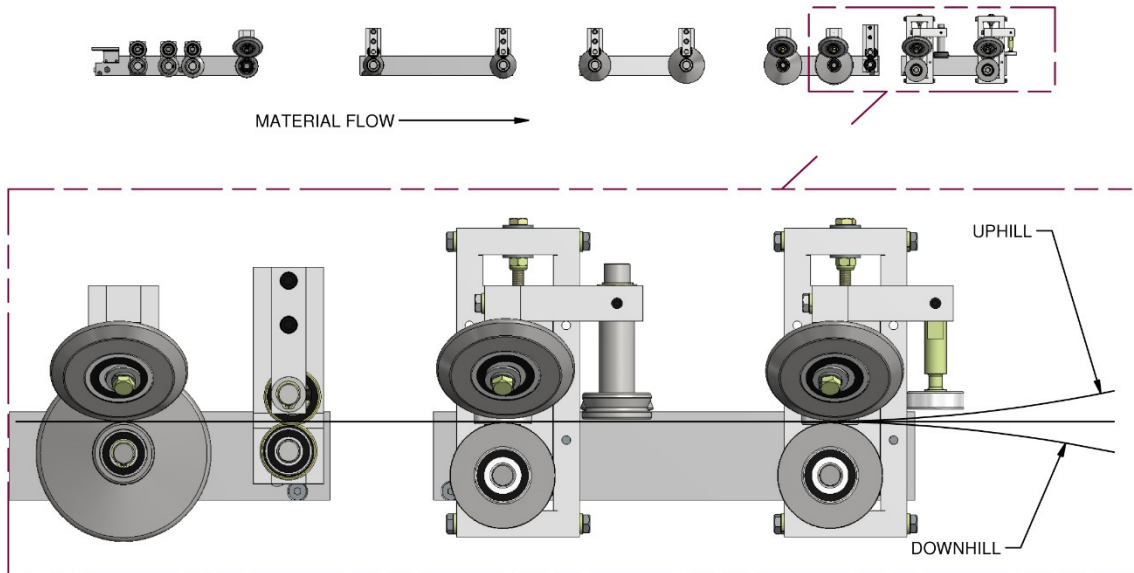
**Figure 44: Eccentric Shaft Too Tight**

## CHAPTER 17

# **PROFILE ADJUSTMENTS**

### **CAMBER STATIONS**

Every roller set is equipped with one or more camber stations toward the exit end of the machine. The camber station adjustment can be used to make the panel run straight if it is going uphill or downhill.



**Figure 45: Camber Adjustment - Uphill/Downhill**

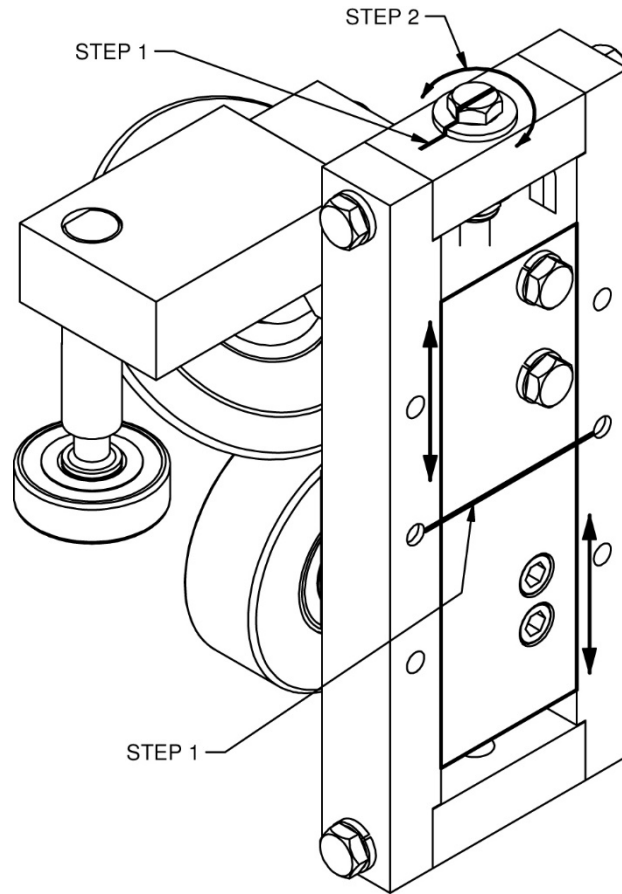
If the panel is going uphill or downhill, ensure that the run-out stands are properly adjusted for height and that the panel is able to run straight out of the machine. If the run-out stands are in the correct alignment, adjust the camber stations as necessary using the following procedure: (See Figure 46)

1. Create a base point to start from by marking the top camber bolt as well as scribing a line across the center block and the two uprights.
2. If the panel is running downhill, adjust the 2<sup>nd</sup> to last station down by turning the top bolt counter-clockwise. If the panel is running uphill, adjust the 2<sup>nd</sup> to last station up by turning the top bolt clockwise.

Note: It is recommended to make small adjustments such as a 1/8 turn. Then run a panel to see the results after each adjustment. Over adjusting the stations can have unpredictable results.

CHAPTER 17

**PROFILE ADJUSTMENTS**



***Figure 46: Camber Adjustment***

# ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

## ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

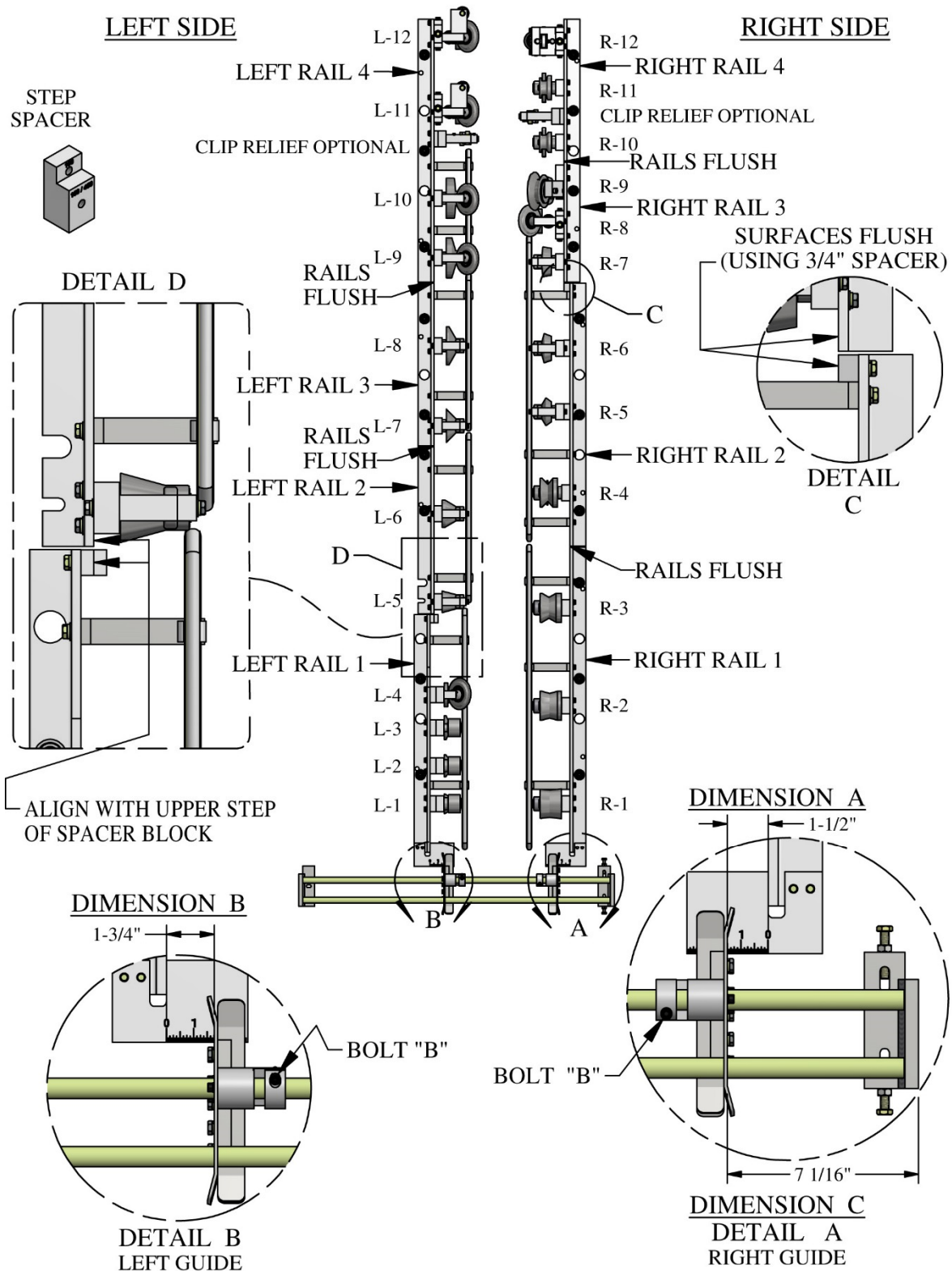


Figure 47: SSH100 Roller System

CHAPTER 18

# ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

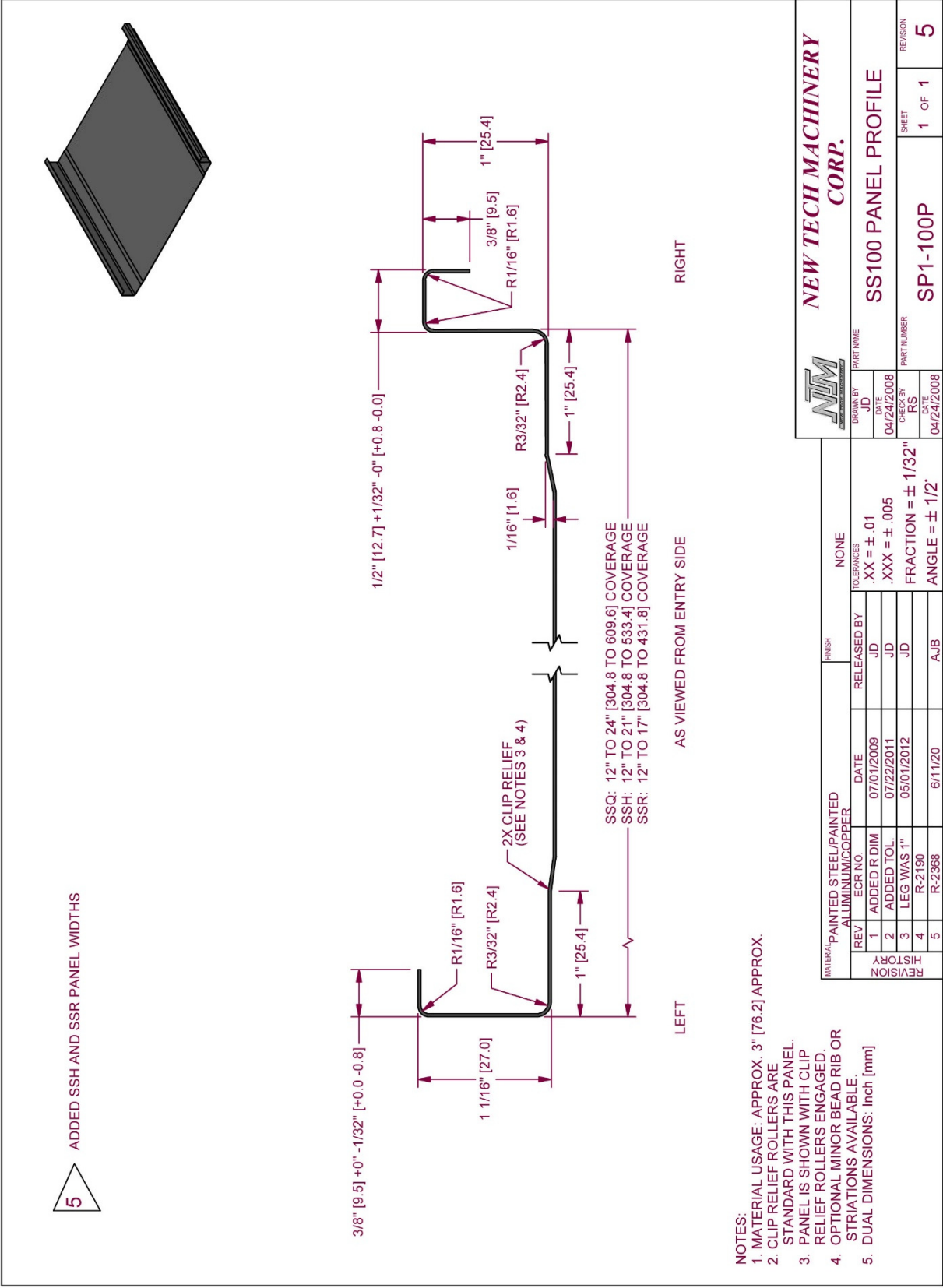


Figure 48: SS100 Panel Profile

# CHAPTER 18

## ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

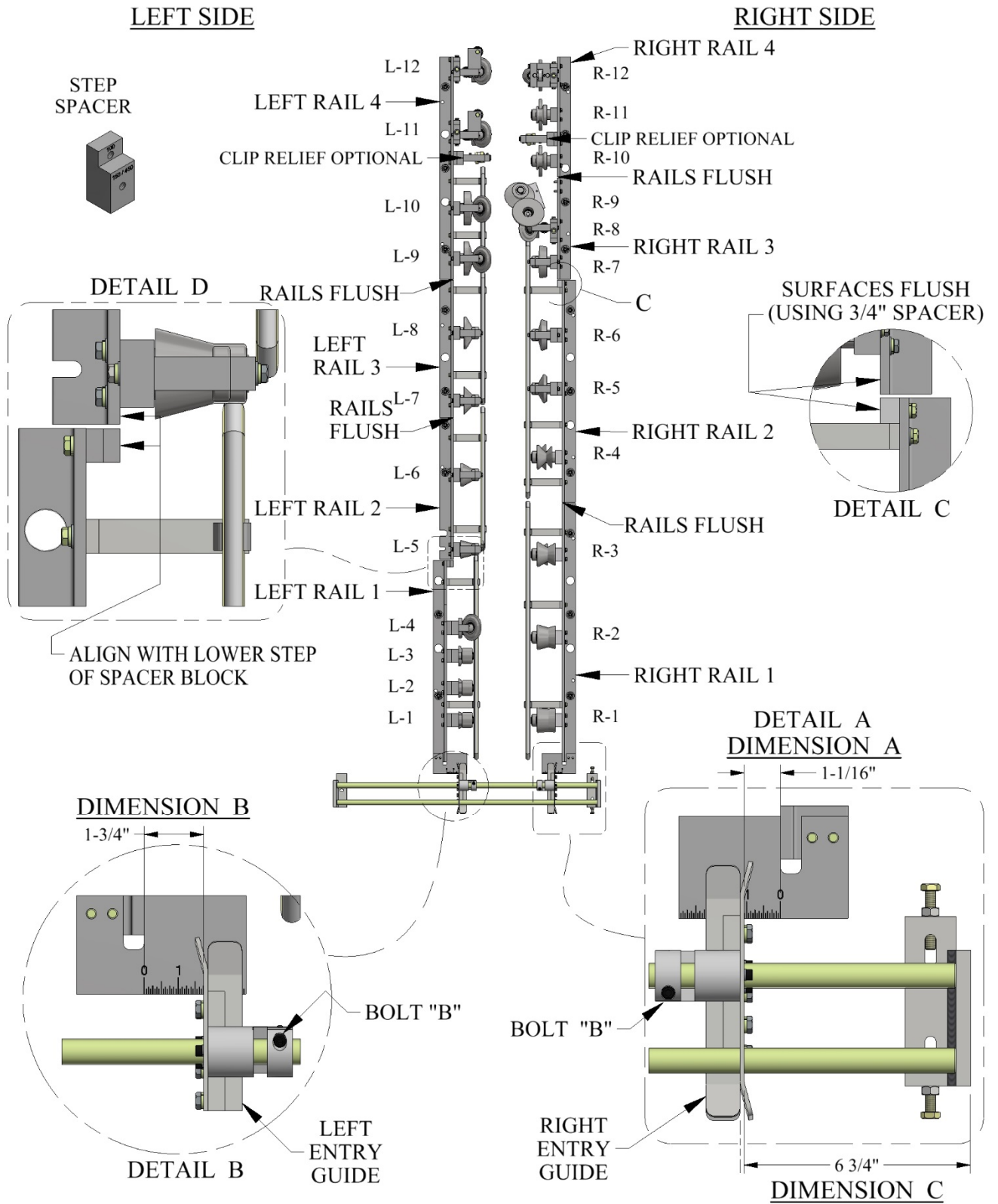


Figure 49: SSH150 Roller System



# CHAPTER 18

## ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

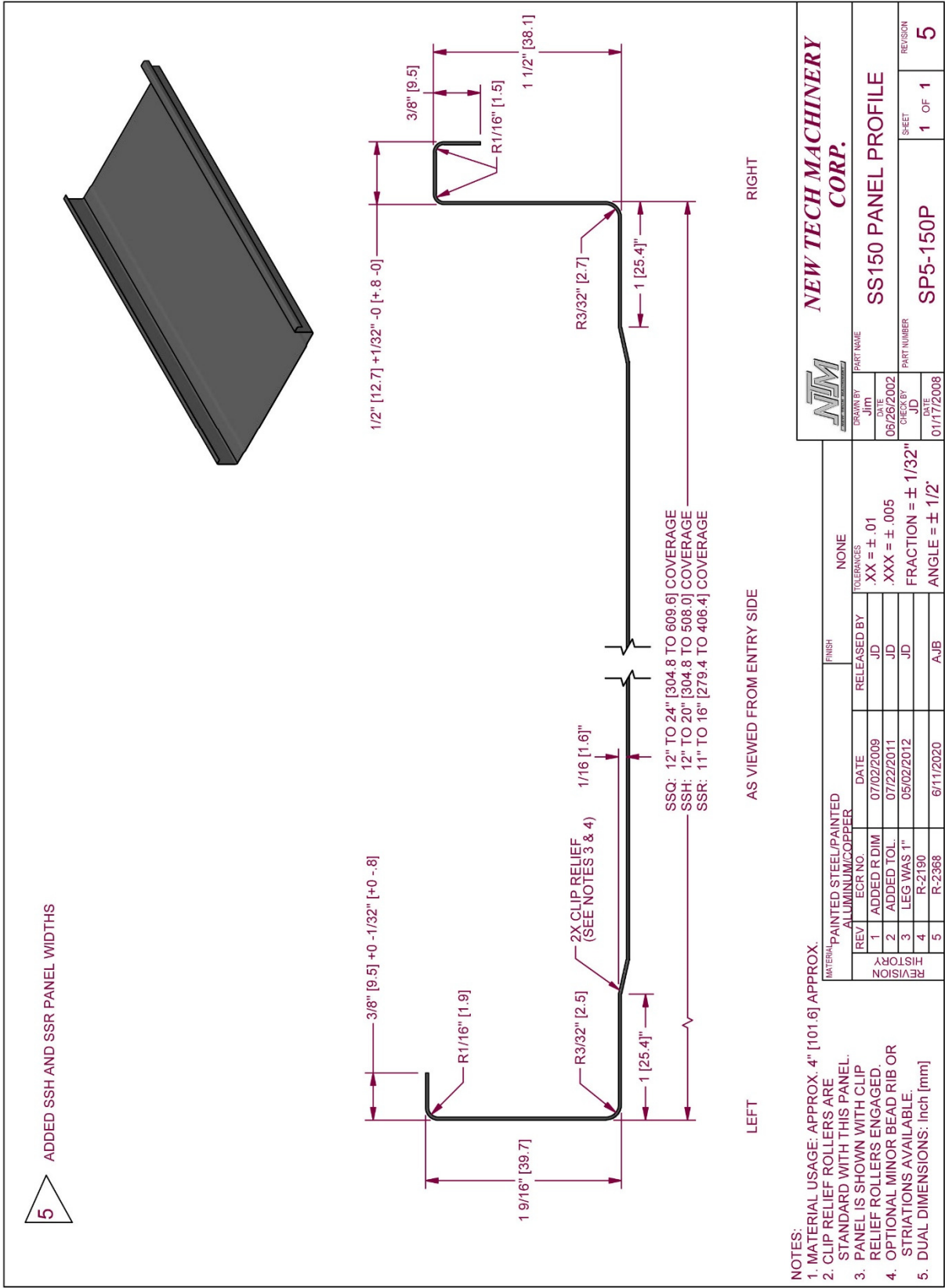
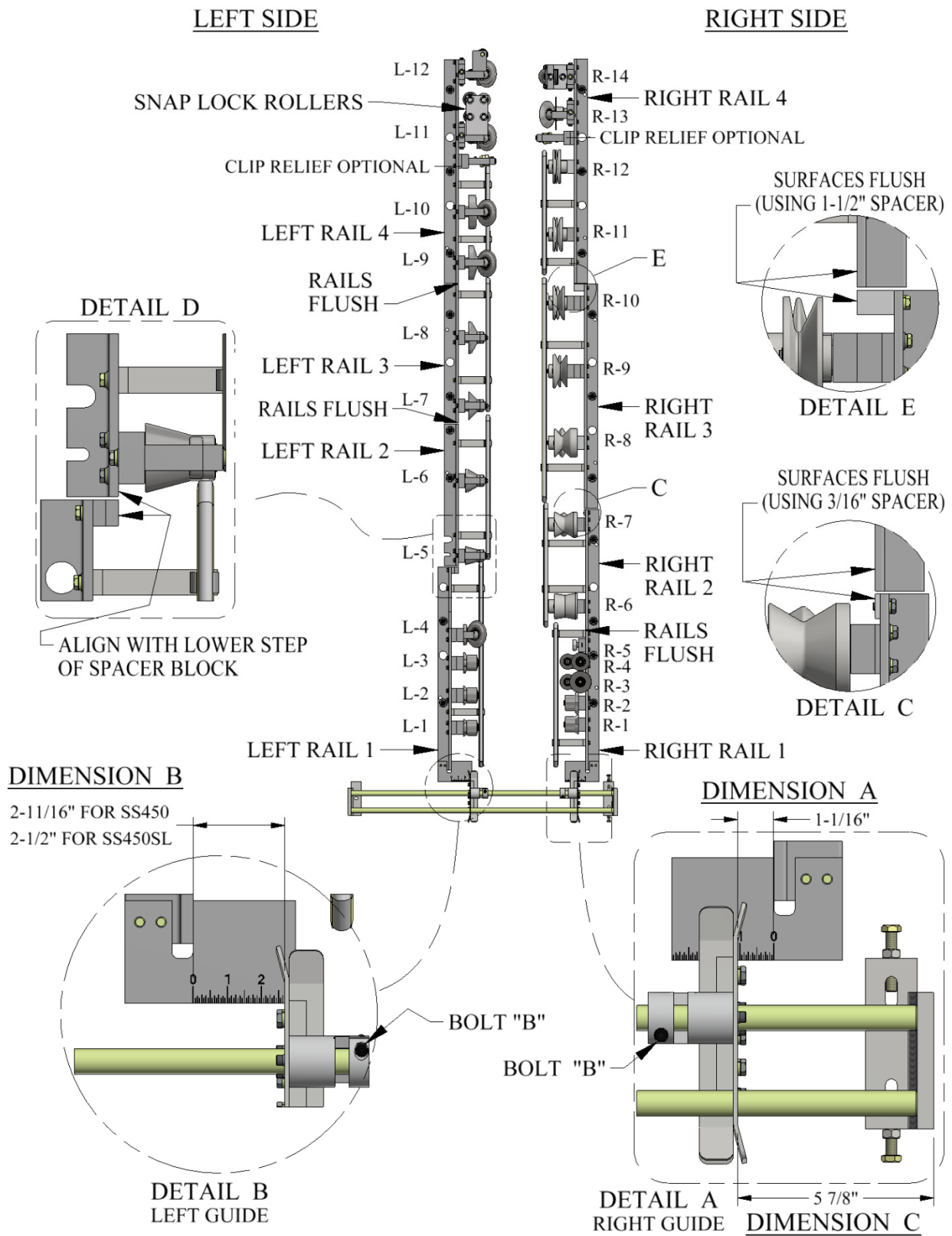


Figure 50: SS150 Panel Profile

# CHAPTER 18

## ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS



**Figure 51: SSH450/450SL Roller System**

# ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

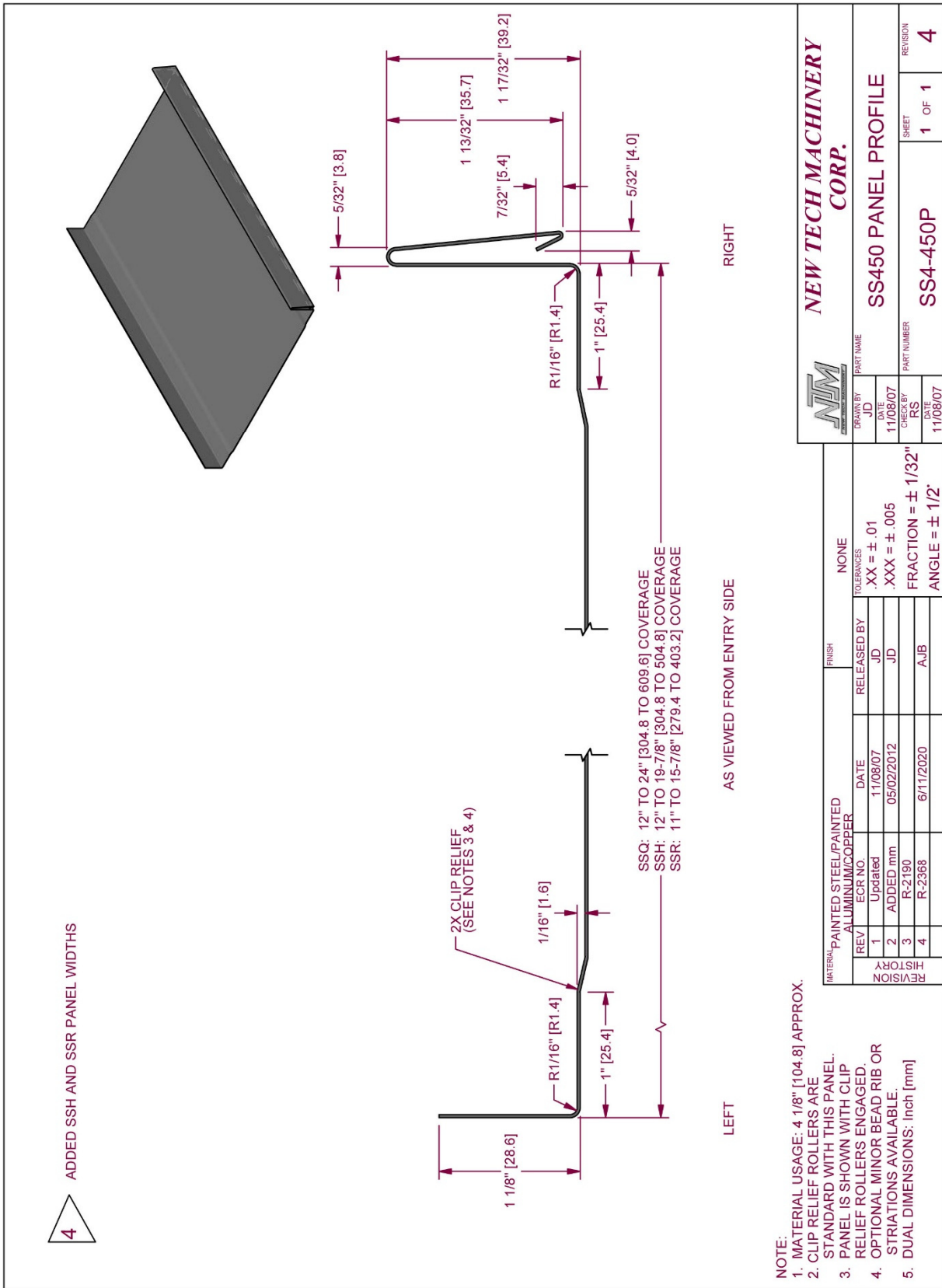


Figure 52: SS450 Panel Profile

# CHAPTER 18

## ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

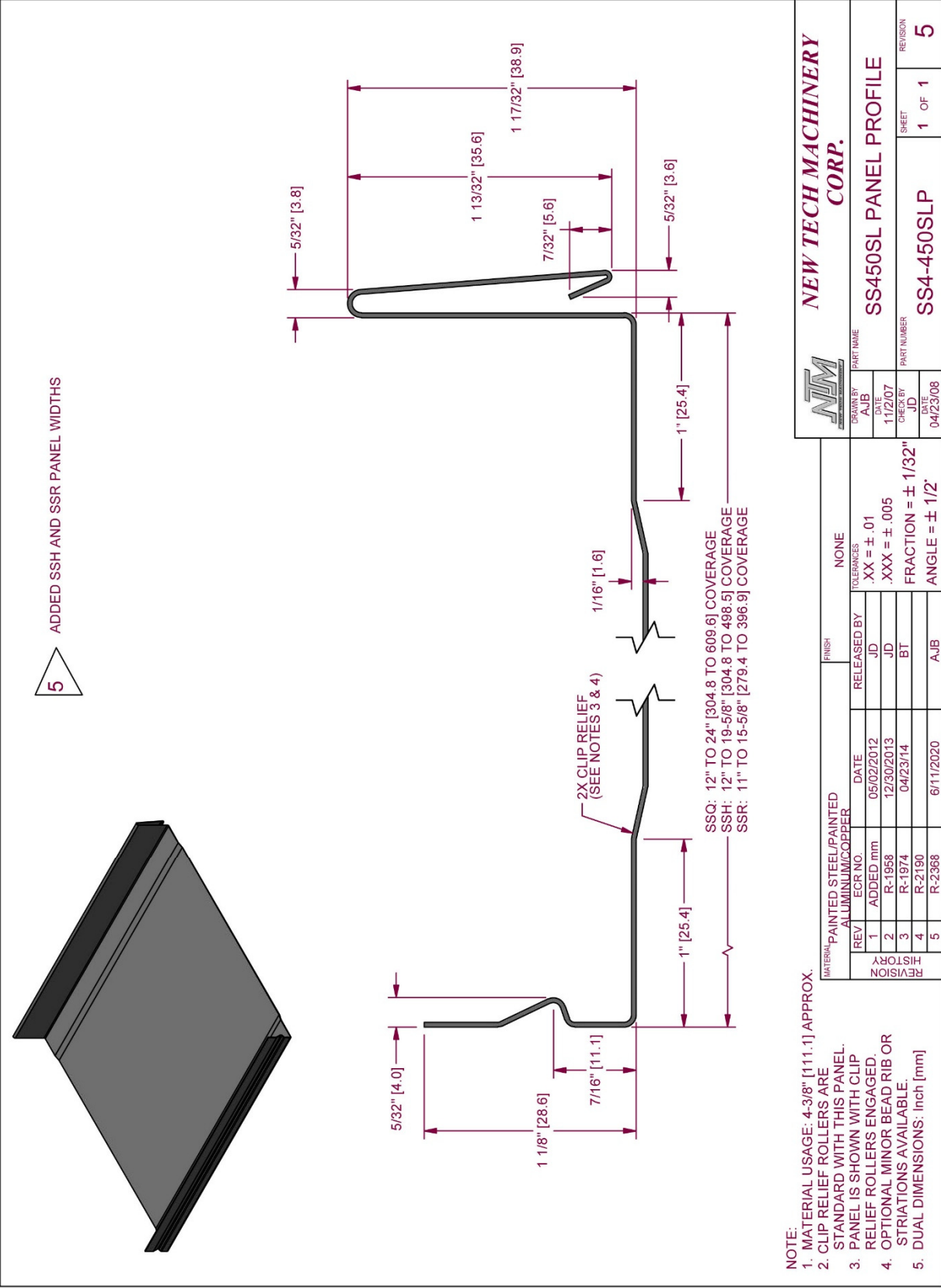
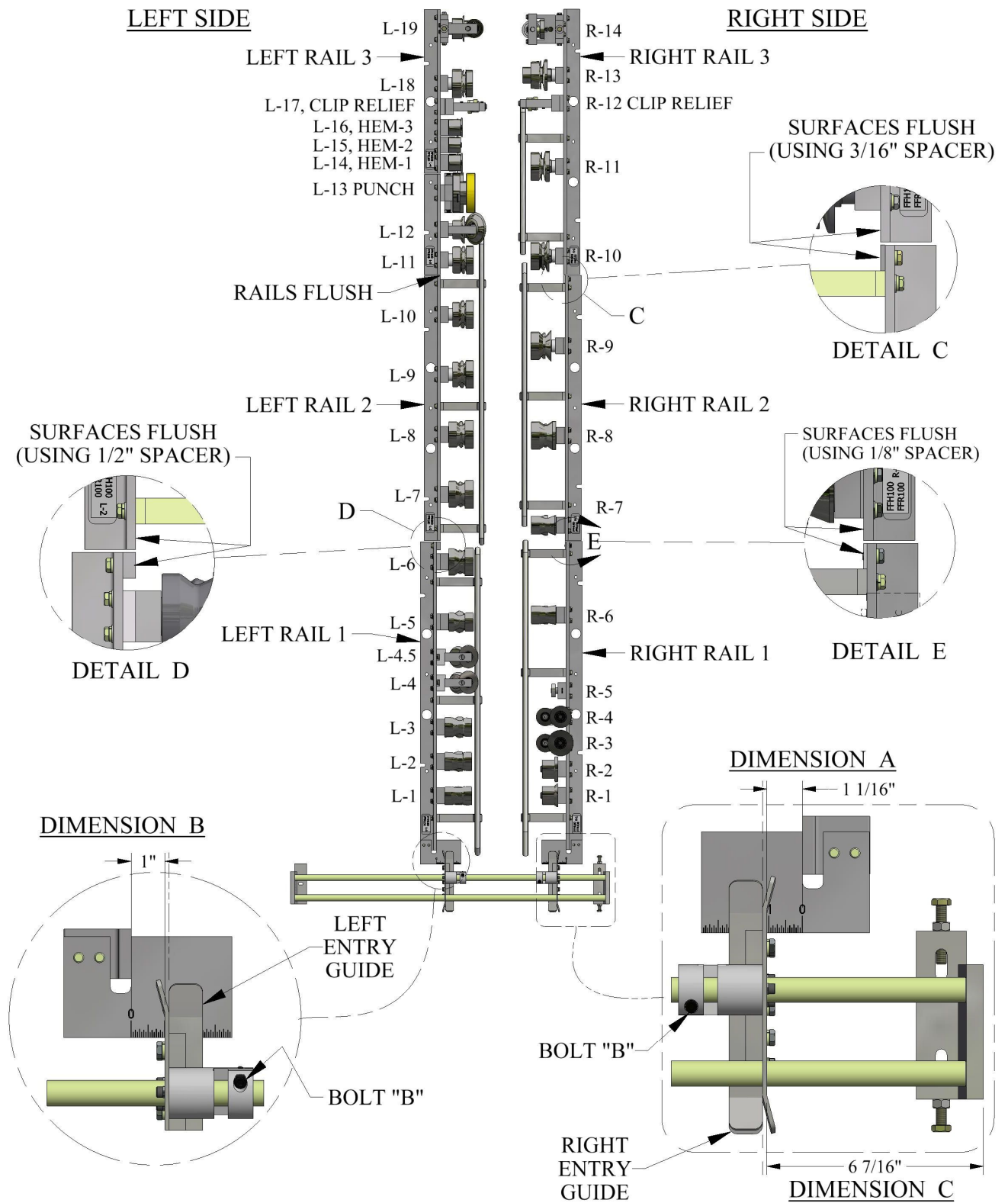


Figure 53: SS450SL Panel Profile

# CHAPTER 18

## ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS



**Figure 54: FFH100 Roller System**



# CHAPTER 18

## ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

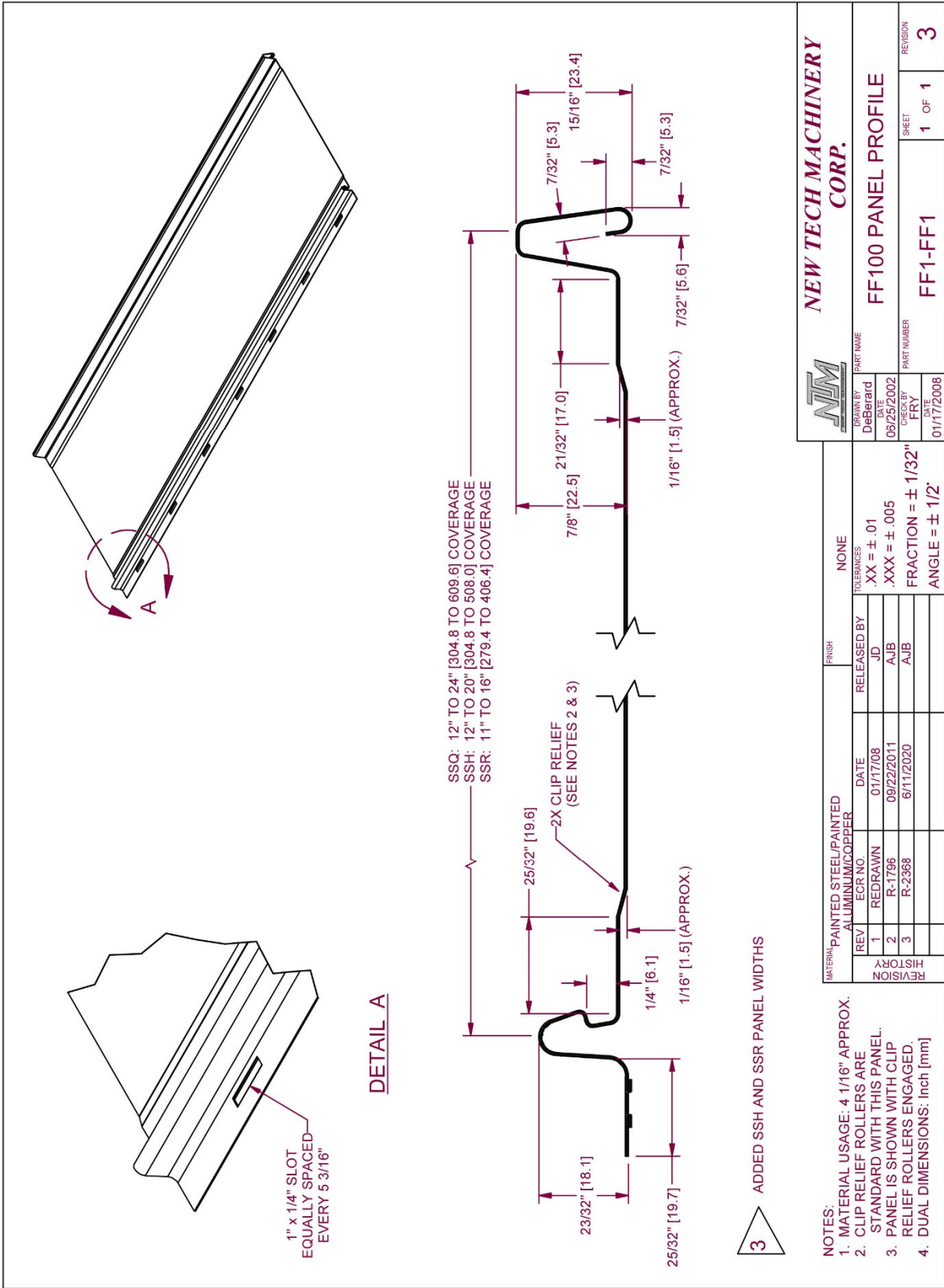
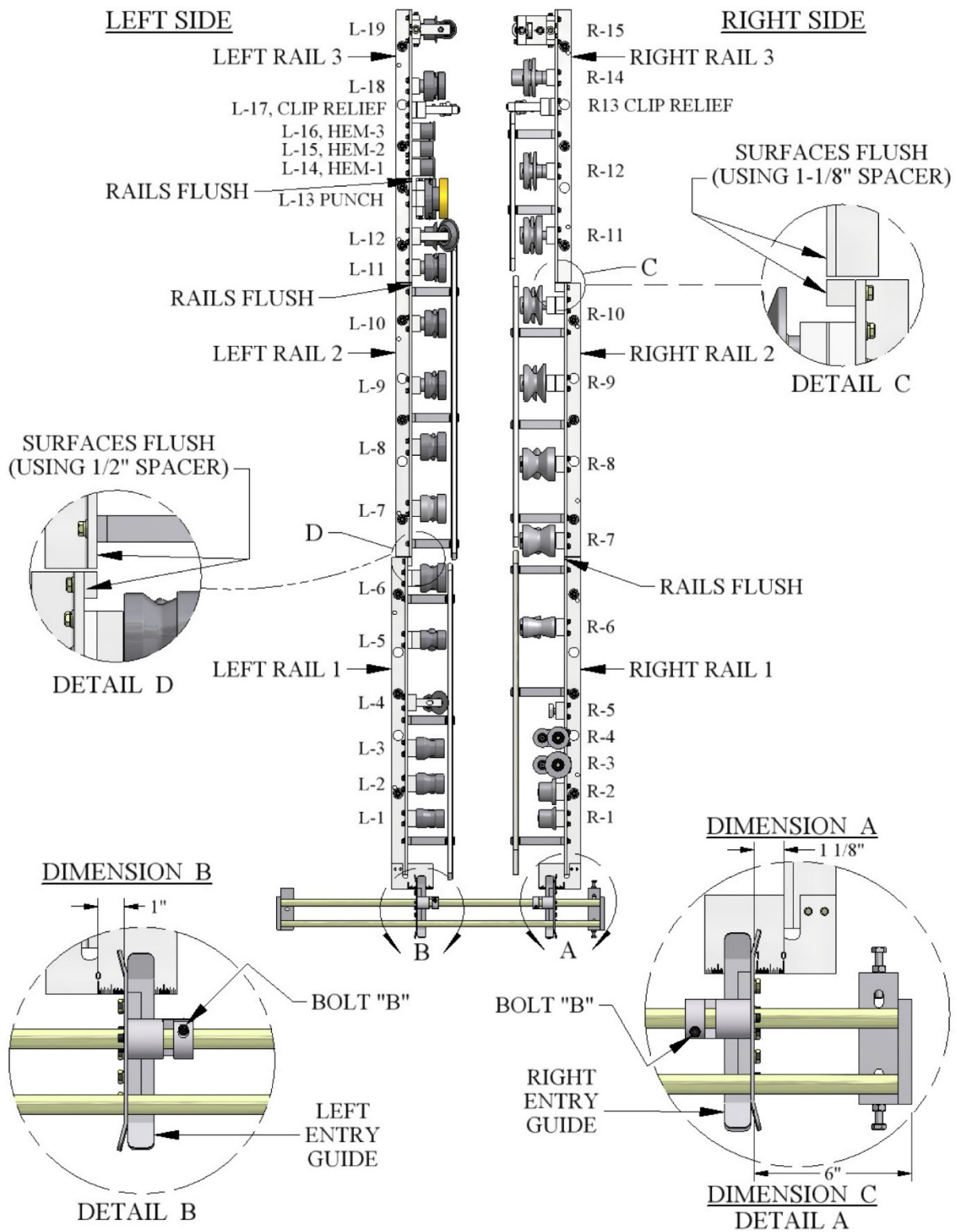


Figure 55: FF100 Panel Profile

# CHAPTER 18

## ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS



**Figure 56: FFH150 Roller System**

# CHAPTER 18 ROLLER SYSTEMS AND PANEL PROFILE DRAWINGS

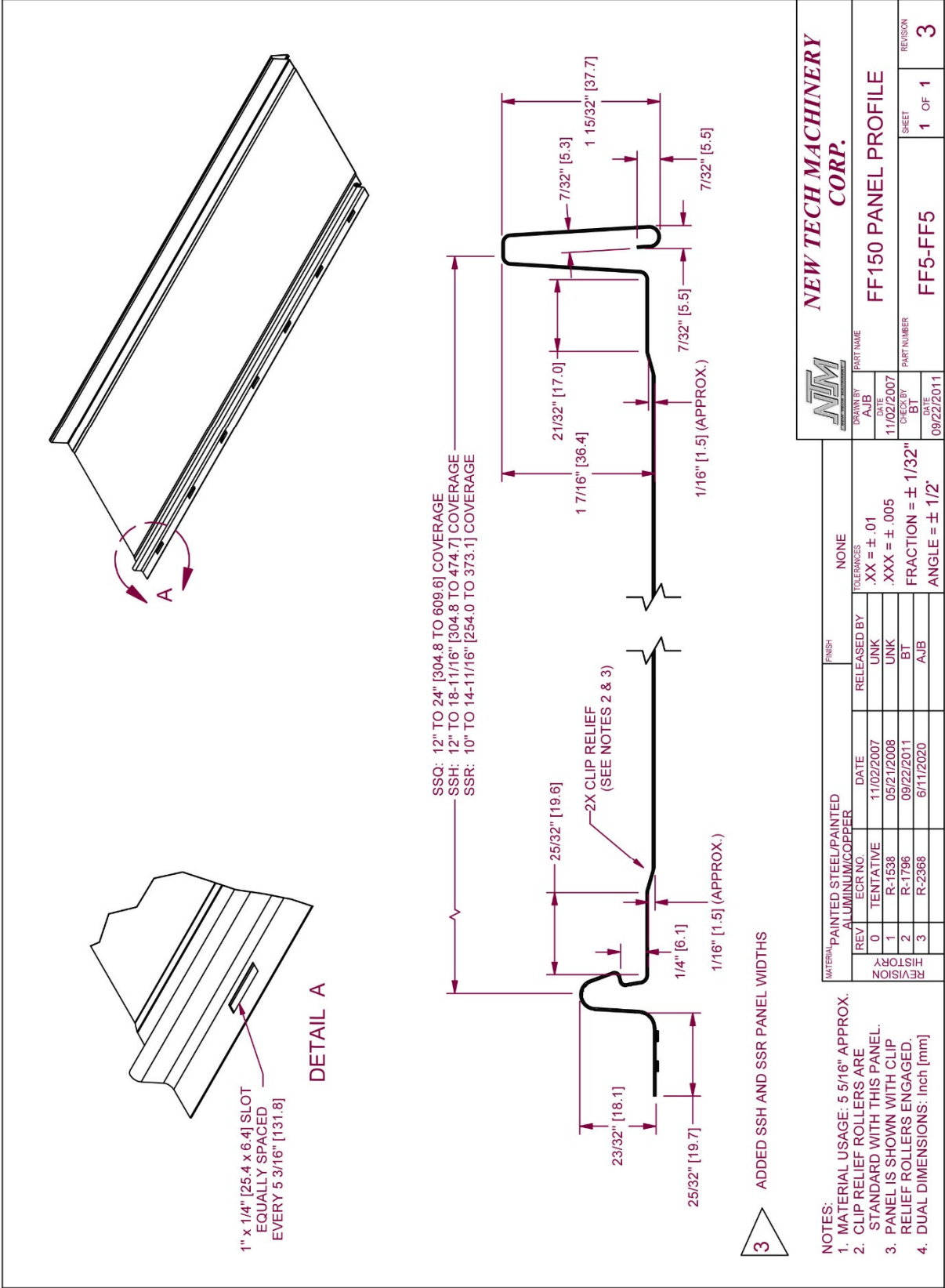
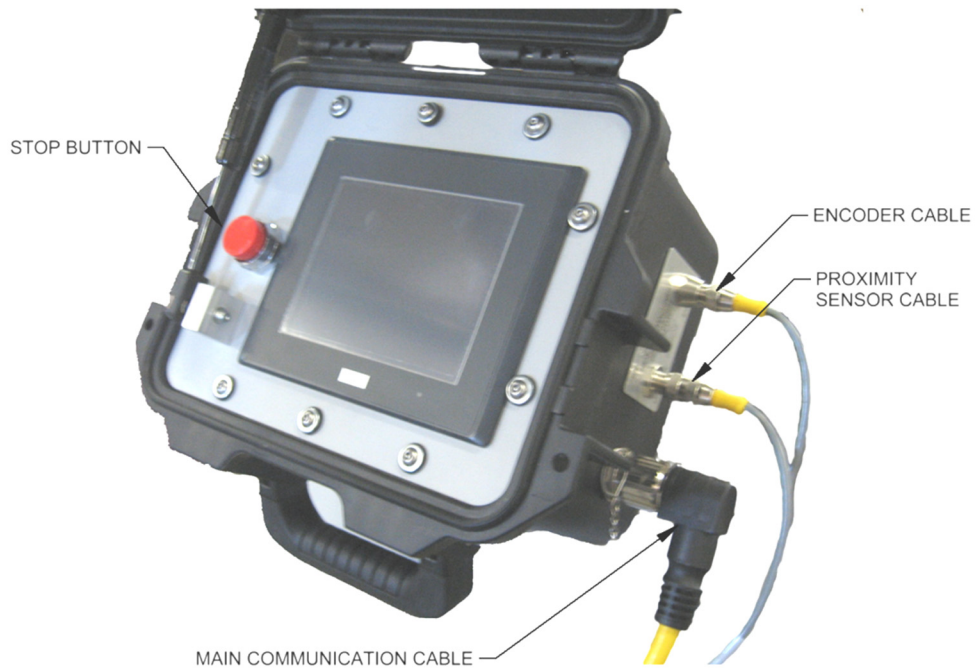


Figure 57: FF150 Panel Profile



APPENDIX A  
**PLC CONTROLLER**

**PLC CONTROLLER**



***Figure 58: PLC Assembly***



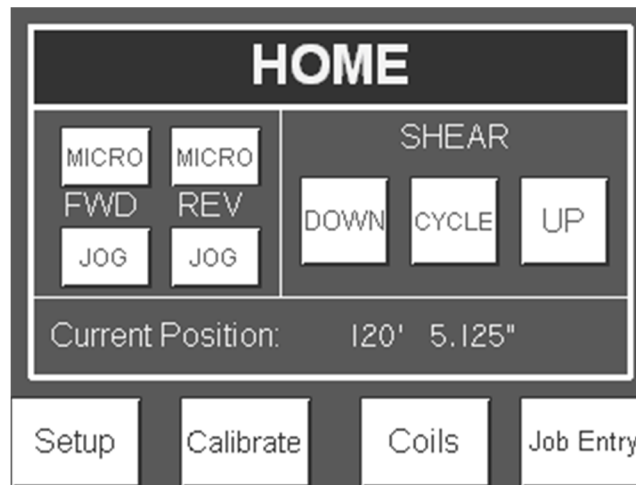
***Figure 59: Serial Number Plate***

## APPENDIX A

# PLC CONTROLLER

### **Home**

When the controller is turned on, it will automatically go to the home screen.



**Figure 60: Home Screen**

### **Manual Operation**

The machine can be manually operated from the home screen by pressing the Jog and Shear buttons.

#### **JOG:**

FWD and REV JOG buttons will jog the machine forward and reverse as long as the button is depressed. When the JOG buttons are released, the action will stop. The FWD and REV MICRO buttons will jog the material approximately ¼" each time the button is pressed.

#### **SHEAR:**

The shear UP and DOWN buttons are momentary and will act in a similar manner as the jog buttons. The SHEAR CYCLE button only needs to be pressed once and the shear will go to the bottom of the stroke and back up to the top. At any time during the shearing cycle, the UP button on the display or red stop button next to the screen can be pressed to return the shear to the top. CAUTION: The shear will stop **without** returning to the top if the E-Stop pushbutton on the manual control box below the PLC is pressed. This button shuts off all power to the machine and machine controls. Upon start-up, the shear will return to the top.

### **Automatic Operation**

The pre-run sequence must be completed in the correct order before automatic operation can be utilized.

#### **Pre-Run Sequence:**

## APPENDIX A

# PLC CONTROLLER

1. Jog the material forward using the manual FWD JOG or MICRO buttons on the Home screen or the JOG switch at the entry end of the machine. The material must exit the shear and be detected by the panel detection sensor.
2. Shear the material using the Shear Cycle button. At that point, the machine will be fully loaded with material, the length counter will be reset and the controller will be ready to run in automatic mode.

If the machine goes forward or reverse and the encoder does not detect movement, the pre-run sequence will be reset and the controller will not run in automatic mode. This would happen if the material was cut at the entry end of the machine at the end of a job or at the end of a coil. This could also happen if the encoder did not have proper tension on the material.

### ***Job Entry***

Jobs can be programmed to run automatically. From the Home screen, press the Job Entry button to enter the Job Entry Screen.

The screenshot shows the 'JOB ENTRY' screen with the following elements:

- Job Number:** A display showing '6' with 'Prev.' and 'Next' buttons on either side.
- Quantity:** A display showing '1 of 10'.
- Length (ft/in):** A display showing '150' with a '6' button, a fraction bar, a '1' button, and an '8' button.
- Pause At End Of Job:** Two buttons labeled 'No' and 'Yes'.
- Bottom Navigation Bar:** Four buttons labeled 'Home', 'Clear Job', 'Clear All', and 'Run Mode'.

**Figure 61: Job Entry Screen**

### ***Programming Jobs***

The controller can store up to ninety nine jobs or lengths, called: Job Numbers. Press the Previous and the Next buttons to change the Job Number. The Job Number display is also an input in order to skip many jobs at a time. Press the Job Number display and enter the desired job number to program or run.

Enter in the quantity of parts to run and the length of the part.

Specify if the machine will pause at the end of job. If Yes is selected, the machine will stop after the job is done running. The user can then press Start to run the next job or return to the Job Entry. If No is selected, the machine will run the current job and automatically start running the next job. If yes is selected and there is no job

## APPENDIX A

# PLC CONTROLLER

programmed after the current job, the controller will stop and return to the Job Entry screen.

### ***Clear Jobs***

To clear the current job on the screen press Clear Job. To clear all the jobs in the controller, press Clear All. The next screen will confirm the Clear All command, press Yes to clear all jobs.

### ***Auto Run***

Press the Run Mode button to run the jobs that are programmed. Type in the job number to run first (if different than the job that was just programmed).

The screen displays the title "AUTO RUN" at the top. Below it, the instruction "Enter in the job number to run first:" is shown. A label "Job Number:" is followed by a text input field containing the number "6". At the bottom of the screen, there are two buttons: "Back" on the left and "Enter" on the right.

***Figure 62: Specify Job to Run First***

Then hit Enter to continue to the Auto-Run mode.

The screen displays the title "AUTO RUN" at the top. Below it, the following information is shown: "Job Number: 6", "Quantity: 1 OF 10", "Length To Run: 150' 6 1/8", "Current Position: 120' 5.125\"", and "Speed: 0.0 FPM". A "Start" button is located to the right of the speed information. At the bottom of the screen, there are two buttons: "Back to Job Entry" on the left and "Stop & Calibrate" on the right.

***Figure 63: Auto-Run Screen***

## APPENDIX A


# PLC CONTROLLER

### ***Automatic Operation***

In the Auto Run screen, the current job and progress are displayed. Press the Start button to begin running the job. When the current job is complete the next job will start if the No button for pause was pressed for the current job. If the Yes button was pressed for pause or if there is no next job programmed, the controller will return to the Job Entry screen after the current job is completed.

### ***On the Fly Calibration***

The controller can be calibrated at any time while the machine is running to improve accuracy of the parts being run. If the machine is consistently making parts too short or too long, press Stop & Calibrate to bring up the Calibration screen.



The Calibration screen is a rectangular interface with a dark background. At the top, the word "CALIBRATION" is displayed in large, white, bold, sans-serif capital letters. Below this, the text "Length of Last Part Produced:" is shown in a smaller white font. Underneath, the value "150' 6 1/8\"" is displayed in a large white font. Below that, the text "Enter Actual Measured Length:" is shown in a smaller white font. Underneath, the value "150' 6 3/16\"" is displayed in a large white font, with each part of the value (150', 6, 3, /, 16") contained within its own separate rectangular input box. At the bottom of the screen, there are three white rectangular buttons with black text: "Cancel" on the left, "Help" in the center, and "Enter" on the right.

***Figure 64: Calibration Screen***

The length of the last part will automatically populate to the length that the controller 'thought' was run. Measure the length of the part, enter in the actual measured length and press Enter to re-calibrate the controller. Or press cancel to return to the Auto-Run screen. Press Start on the Auto-Run screen to continue operation.

### ***Calibration***

The controller can also be calibrated from the Home screen by pressing the Calibrate button. On the calibration screen, enter in the desired part length to use to calibrate the controller. A length of over 12" is required and a length of 36" or more is recommended. Press the Start button to run the specified part.

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**PLC CONTROLLER**

**CALIBRATION**

Enter Calibration Length to Run:

10' 0 / 0"

Run Calibration Length: Start

Cancel Help

**Figure 65: Calibration Screen**

The controller will display the theoretical length of the part after it is produced. The theoretical length may be slightly different than the intended calibration length due. Measure the length of the part and input the length in the Actual Measured Length fields. Press Enter to re-calibrate the controller or Cancel to return to the Home screen without making any changes to the controller.

**CALIBRATION**

Theoretical Length:

10' 0 0 / 0"

Enter Actual Measured Length:

10' 0 1 / 16"

Cancel Help Enter

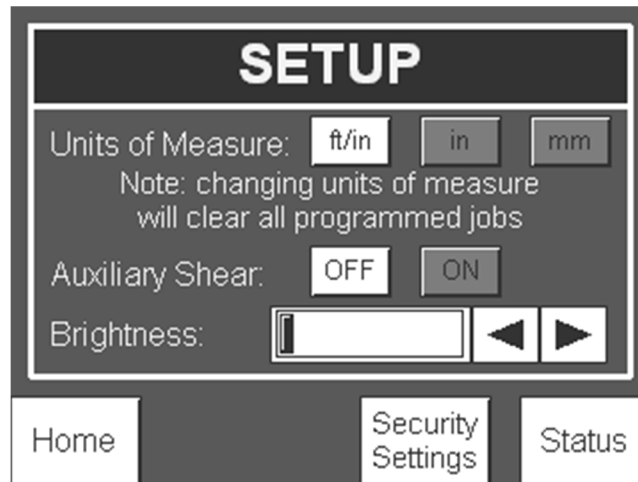
**Figure 66: Calibration Screen**

**Setup:**

From the Home screen, press the Setup button to make setting changes to the controller.

## APPENDIX A

# PLC CONTROLLER



**Figure 67: Setup Screen**

In the Setup screen, the Units of Measure can be changed to Imperial units in either feet or inches (ft/in) or only inches (in) or Metric units (mm).

Example:

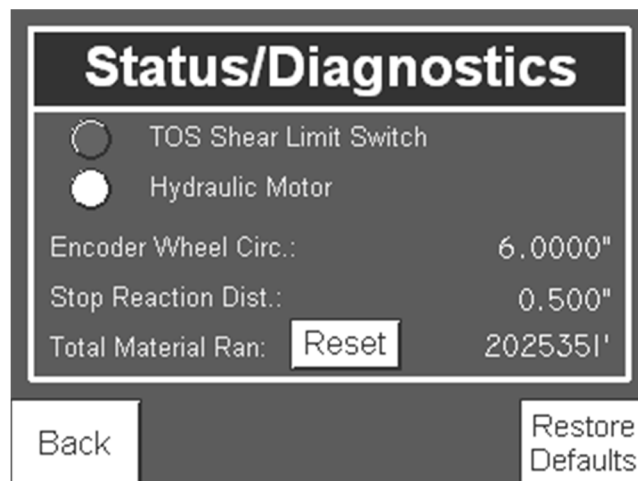
ft/in: 10' 4 1/16"  
in: 124 1/16"  
mm: 3,151mm

The shear operation can be turned on and off if an auxiliary shear such as the Swenson Snap Table will be utilized.

The brightness of the display can also be adjusted up or down by pressing the right and left arrow buttons.

### ***Status/Diagnostics:***

In order to help troubleshoot the machine, press the Status button found in on the setup screen to bring up the status of the machine as seen from the controller.



**Figure 68: Status Screen**

## APPENDIX A

# PLC CONTROLLER

The Status 1 screen shows the condition of the Hydraulic Pressure Switch and the Top of Stroke Limit Switch. If one or both of the TOS Shear Limit Switches are not activated the TOS Shear Limit Switch light will be on. Refer to the Shear section in the machine manual for limit switch adjustment.


If the motor is not on or if the pressure switch is not activated then the Hydraulic Motor light will be on.

The Status screen lists the Encoder Wheel Circumference. This value is changed automatically when the controller is calibrated. The Stop Reaction Distance is also automatically changed by the controller as the machine runs. In order to reset these values, press the Restore Defaults button. NOTE: Calibration should be initiated following the defaults restore. The Total Material Ran through the machine with the controller on is shown on this screen. The Total Material Ran can be reset by pressing the Reset button. If the security is turned on, the password will be required to reset the Total Material Ran.

Press Back to return to the Setup Screen.

### **Security:**

From the Setup screen press the Security Settings button to enter the security screen. The default password is: 1234.



The screenshot shows a 'SECURITY' screen with a dark background and white text. At the top, the word 'SECURITY' is in large, bold, white capital letters. Below it, the text 'Security Features:' is followed by two buttons: 'OFF' and 'ON'. The 'ON' button is highlighted. Below this, there are two password fields. The first is labeled 'Current Password:' and shows '1 2 3 4'. The second is labeled 'New Password:' and also shows '1 2 3 4'. At the bottom of the screen, there are two buttons: 'Enter' on the left and 'Help' on the right.

**Figure 69: Security Screen**

If the security is turned on, the password will be required to change the stored coil lengths and colors or to reset the Total Material Ran value (totalizer). If security is turned off, no password is needed to make changes to these values. With security turned off the Security screen displays the current password which can be changed by entering a new password and pressing the enter button. Once this is done, the new password will be needed to make any changes to the coil lengths and colors or to reset the Total Material Ran.

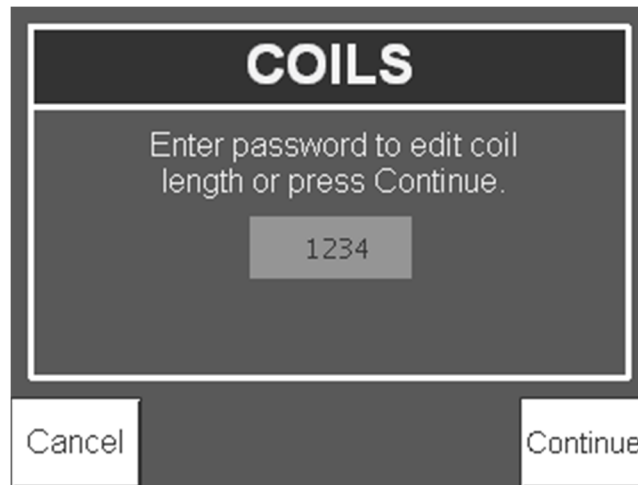


## APPENDIX A

# PLC CONTROLLER

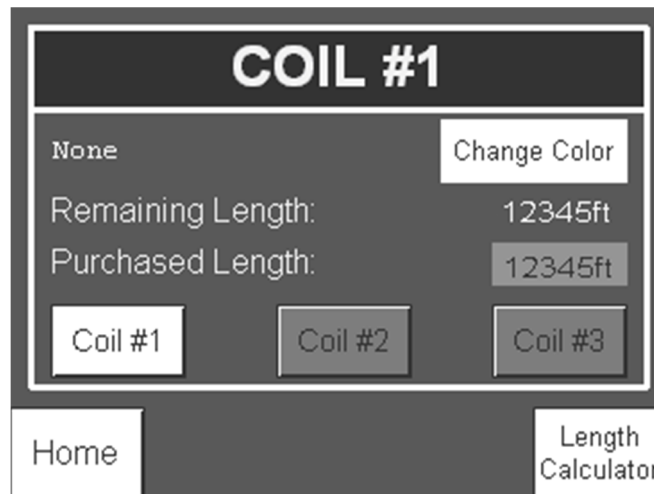
### ***Coil Tracking:***

From the Home screen, press the Coils button to change the coil of material to track. If the security is turned on, a password must be entered if changes to the stored coils are necessary. If security is turned off, the controller will display the current coil screen and changes can be made without the password.



***Figure 70: Coils Password Access Screen***

Without the password, press Continue to view the Coils screen.



***Figure 71: Coils Screen***

The controller has the ability to track the length of three different coils of material. Press Coil #1, 2 or 3 to change the coil to be run through the machine. When a new coil is purchased, press the Purchased Length numerical display to input the length of the coil into the controller. The Remaining Length will reset to the new purchased length. As material is run through the machine, the controller will subtract material from the remaining length. The coil (#1, 2 or 3) that is displayed when the Home button is pressed will be the coil that the controller subtracts material from as the machine is run.

## APPENDIX A

# PLC CONTROLLER

### Example:

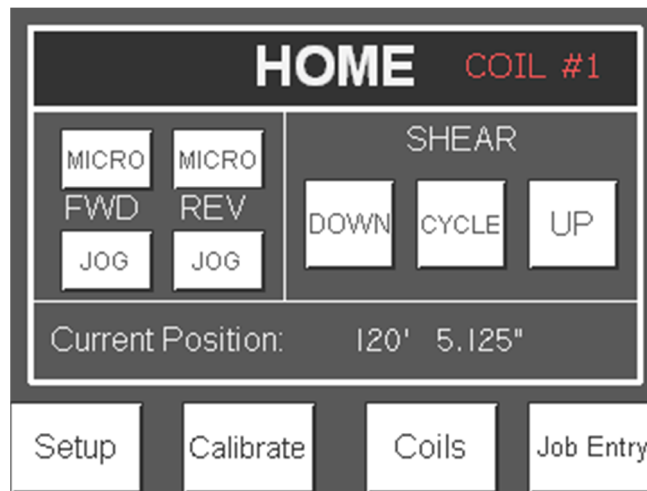
The controller is set to run a black coil designated as Coil #2 and the user changes to a white coil designated by Coil #1. From the Home screen, press the Coils button which will bring up the Coil #2 information. Press the Coil #1 button and then the Home button.

If the remaining length reads negative then the machine has tracked more material than the purchased length.

### Example:

If a purchased length of 100' is input into the controller then 115' of material is ran through the machine before the coil is gone, the controller will read a remaining length of -15'.

There is an indicator on the top right of the Home screen that indicates which coil is being tracked.



**Figure 72: Coil Indicator**

### Colors

Press the Change Color button to select the color of the coil. Press the Cancel button to avoid changing the color of the coil.

APPENDIX A  
**PLC CONTROLLER**



**Figure 73: Coils Color Screen**

***Coil Length Calculator***

The controller has a built in calculator to estimate the length of a coil based on the dimensions of the coil. From the Coils screen, press Length Calculator button.

A screenshot of a PLC controller screen titled 'WEIGHT TO LENGTH CALCULATOR'. The screen has a dark background with white text. It contains several input fields and a 'Done' button. The input fields are labeled 'Material:', 'ID of Coil:', 'Width of Coil:', 'Thickness of Coil:', and 'Estimated Length:'. The values entered in these fields are '24 GAUGE STEEL', '20"', '18"', '2.625"', and '676 FT' respectively. At the bottom left is a 'Done' button. At the bottom right is a disclaimer: 'The calculated values are estimates and as such New Tech Machinery can assume no liability with the use of this calculator.'

**Figure 74: Length Calculator Screen**

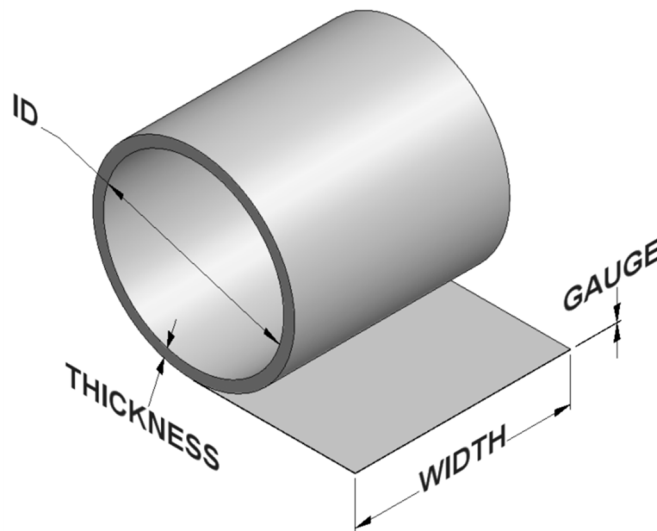
Press the Select Material button to select the thickness and type of material.

APPENDIX A  
**PLC CONTROLLER**

<b>MATERIAL THICKNESS</b>		
Aluminum:	Steel:	Copper:
0.027"	22 Gauge	16 Gauge
0.032"	24 Gauge	20 Gauge
0.040"	26 Gauge	
0.050"	28 Gauge	
	30 Gauge	

**Figure 75: Material and Thickness Screen**

Then enter in the Inside Diameter of the Coil, Width of the coil and thickness of the coil. The thickness of the coil is the difference between the Inside Diameter (ID) and the Outside Diameter (OD). When all the fields are populated, the calculator estimates the length of the coil. Press the Done button to return to the Coils screen.



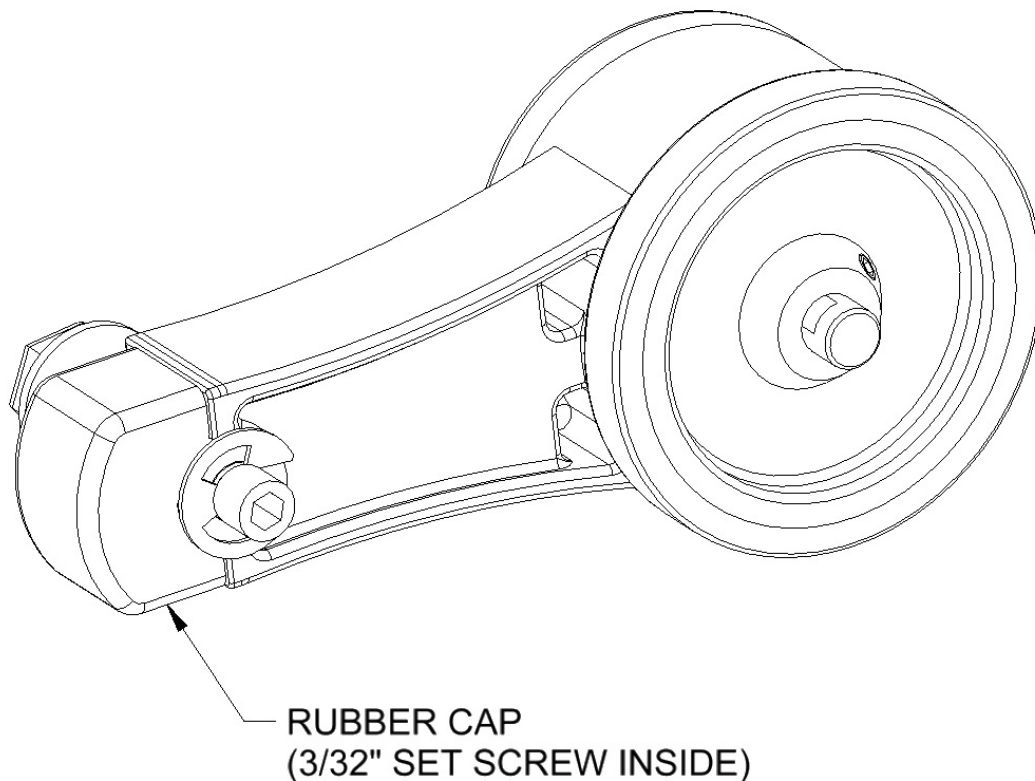
**Figure 76: Coil Dimensions**

APPENDIX A  
**PLC CONTROLLER**

***Encoder Adjustment***

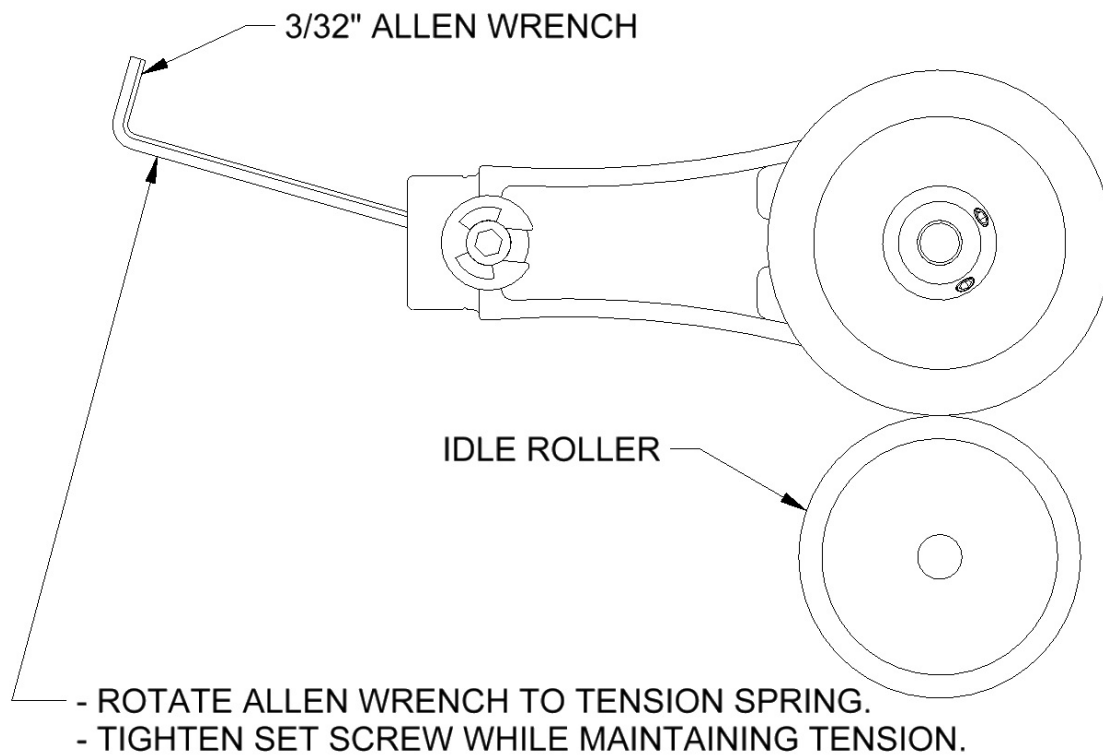
The encoder should have tension on the material in order to track the material accurately. To check the tension on the encoder, gently lift up on the wheel. The encoder should be able to be lifted 1/8" – 1/4" from the surface of the material. If the encoder does not spring back down into position, adjustment may be necessary.

1. Remove the rubber cap from the back of the encoder near the mounting screw.
2. Using a 3/32" Allen wrench, loosen the set screw on the adjustment collar.
3. Rotate the encoder until the wheel contacts the encoder idle roller.
4. Using the Allen wrench for leverage, rotate the adjustment collar around the pivot shaft to increase tension against the idle roller.
5. While maintaining tension on the Allen wrench and adjustment collar, tighten the set screw.
6. Check the tension against the idle roller by pulling up the encoder wheel. Repeat steps if the encoder does not have sufficient tension against the idle roller.
7. Replace rubber cap.



***Figure 77: Encoder Rubber Cap***

APPENDIX A  
**PLC CONTROLLER**



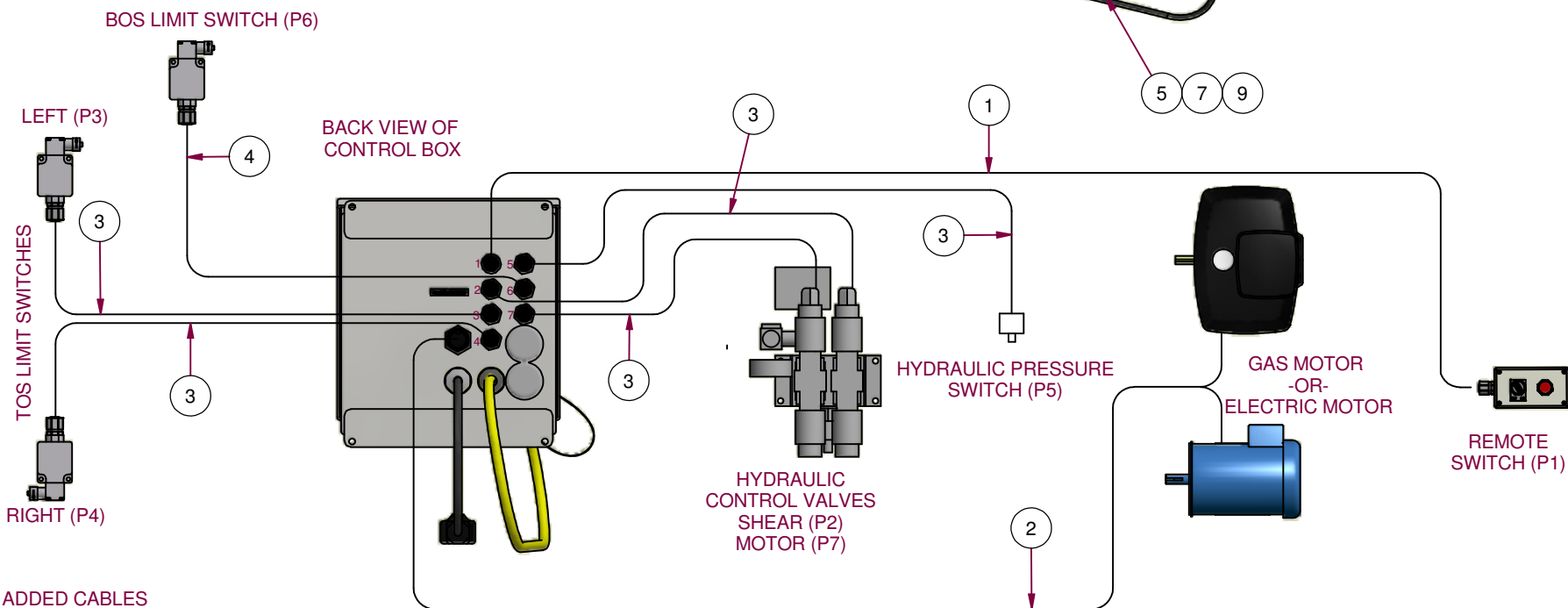
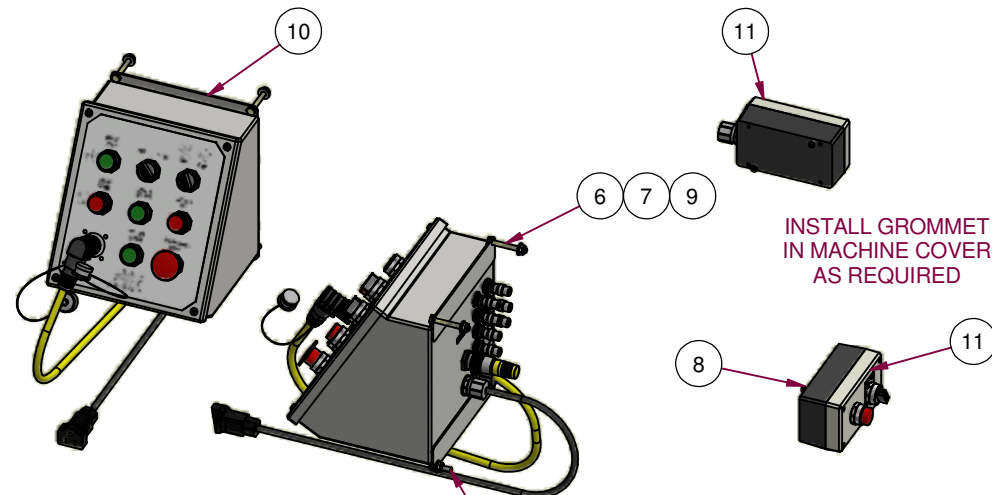
***Figure 78: Encoder Adjustment***

APPENDIX B  
**ELECTRICAL SCHEMATICS**

## **ELECTRICAL SCHEMATICS**

<u>Drawing Number</u>	<u>Sheet Number</u>	<u>Description</u>
PLC-380-000	1	Electrical Assembly – Parts List
PLC-380-000	2	Electrical Assembly – Wiring Details
PLC-381-000	1	Control Box Assembly – Parts List
PLC-381-000	2	Control Box Assembly – Outside & Inside Views
PLC-381-000	3	Control Box Assembly – Wiring Schematic
PLC-381-000	4	Control Box Assembly – Ladder Logic 1
PLC-381-000	5	Control Box Assembly – Ladder Logic 2

Parts List			
ITEM	QTY	PART NUMBER	TITLE
1	1	ELC-100-015	CABLE, 5 PIN, MALE X 6M
2	1	ELC-400-101	CABLE, 6 PIN, MALE/FEMALE X 4M
3	5	ELC-400-105	CABLE, 4 PIN, MALE X 2M
4	1	ELC-400-106	CABLE, 3 PIN, MALE X 2M
5	1	FAS-HC5-118	HEX HEAD CAP SCREW, 1/4-20 x 1" LG.
6	2	FAS-HC5-278	HEX HEAD CAP SCREW, 1/4-20 x 2" LG.
7	3	FAS-NUY-188	NYLOC HEX NUT, #1/4-20
8	2	FAS-SRM-207	SCREW, PAN HEAD, 8 x 1/2", PHIL, SELF-TAPPING
9	3	FAS-WSF-260	WASHER, FLAT, 1/4" SAE
10	1	PLC-381-000	CONTROL BOX ASSEMBLY
11	1	PLC-382-000	REMOTE PUSH BUTTON BOX



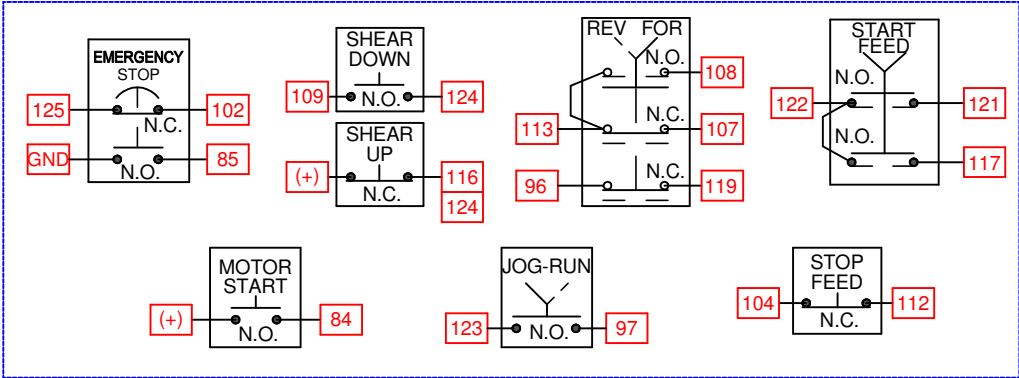
NOTE: UNLESS OTHERWISE SPECIFIED.  
1. R=.015

MATERIAL		LENGTH		FINISH	
SEE BOM		-		NONE	
REVISION HISTORY	REV	ECR NO.	DATE	RELEASED BY	TOLERANCES
	0	R-1757	10/25/2011	AJB	.XX = ± .01
	1	R-2114	01/22/2015	BT	.XXX = ± .005
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					ANGLE = ± 1/2°

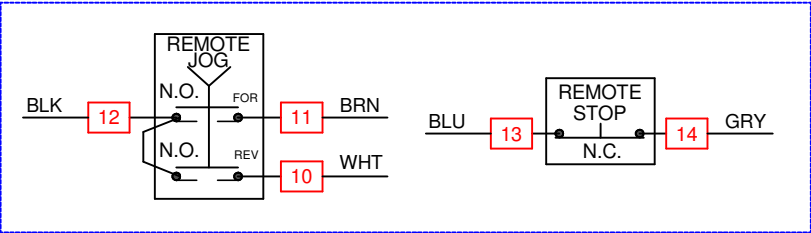
NEW TECH MACHINERY CORP.			
PART NAME		ELECTRICAL ASSEMBLY	
PART NUMBER		PLC-380-000	
SHEET		1 OF 2	
REVISION		1	



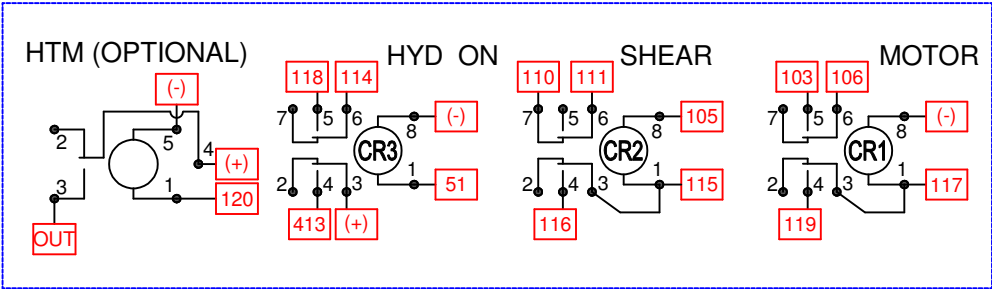
MAIN CONTROL BOX



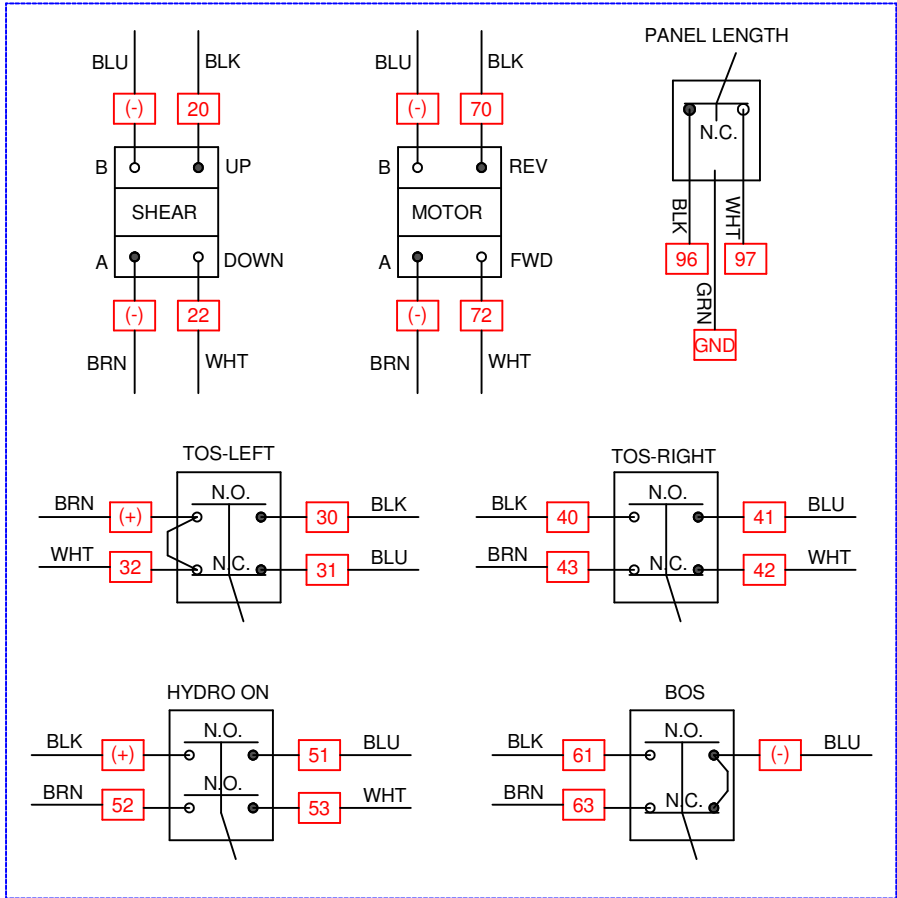
ENTRY END/REMOTE CONTROL



CONTROL RELAYS



COMPONENTS



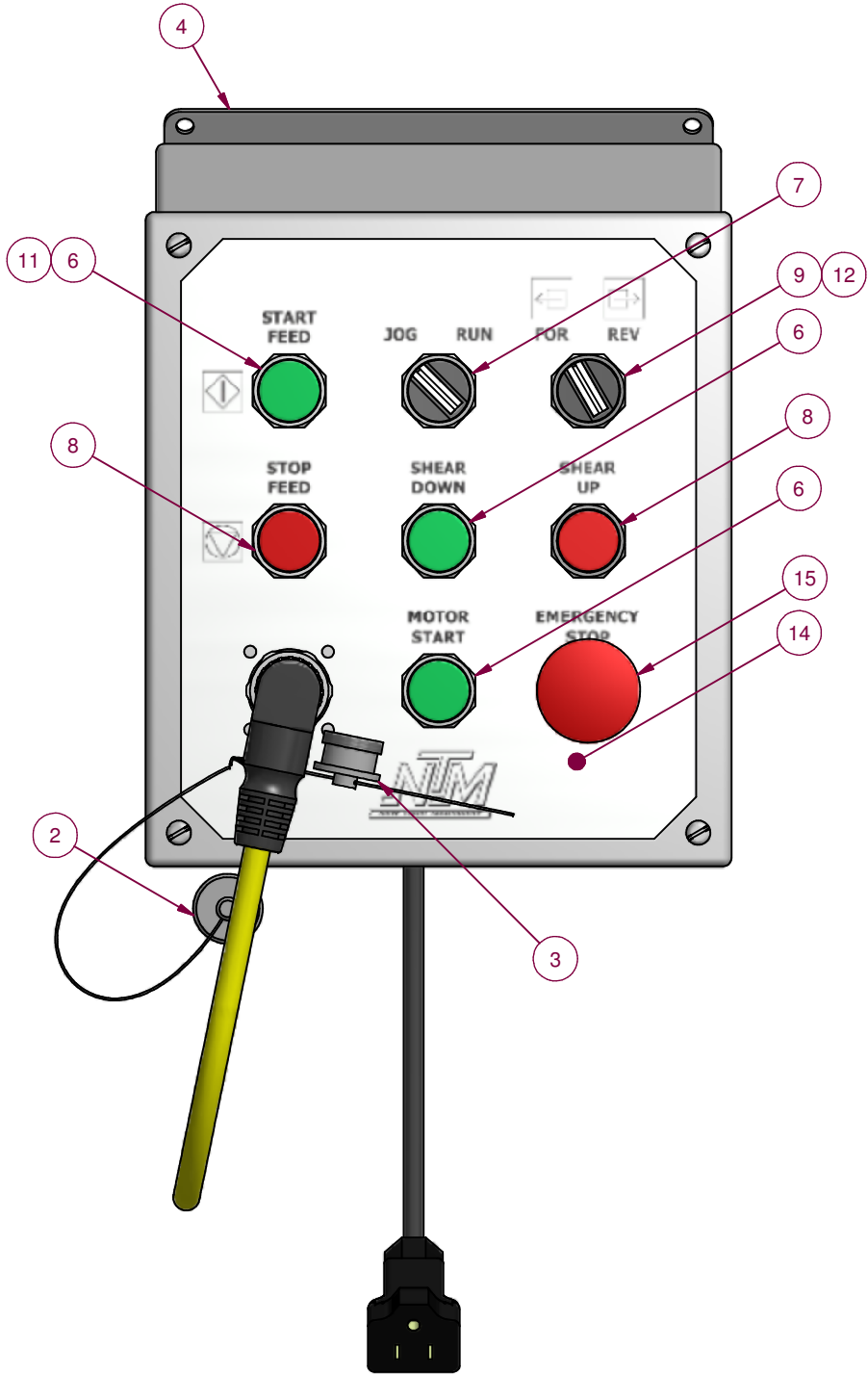
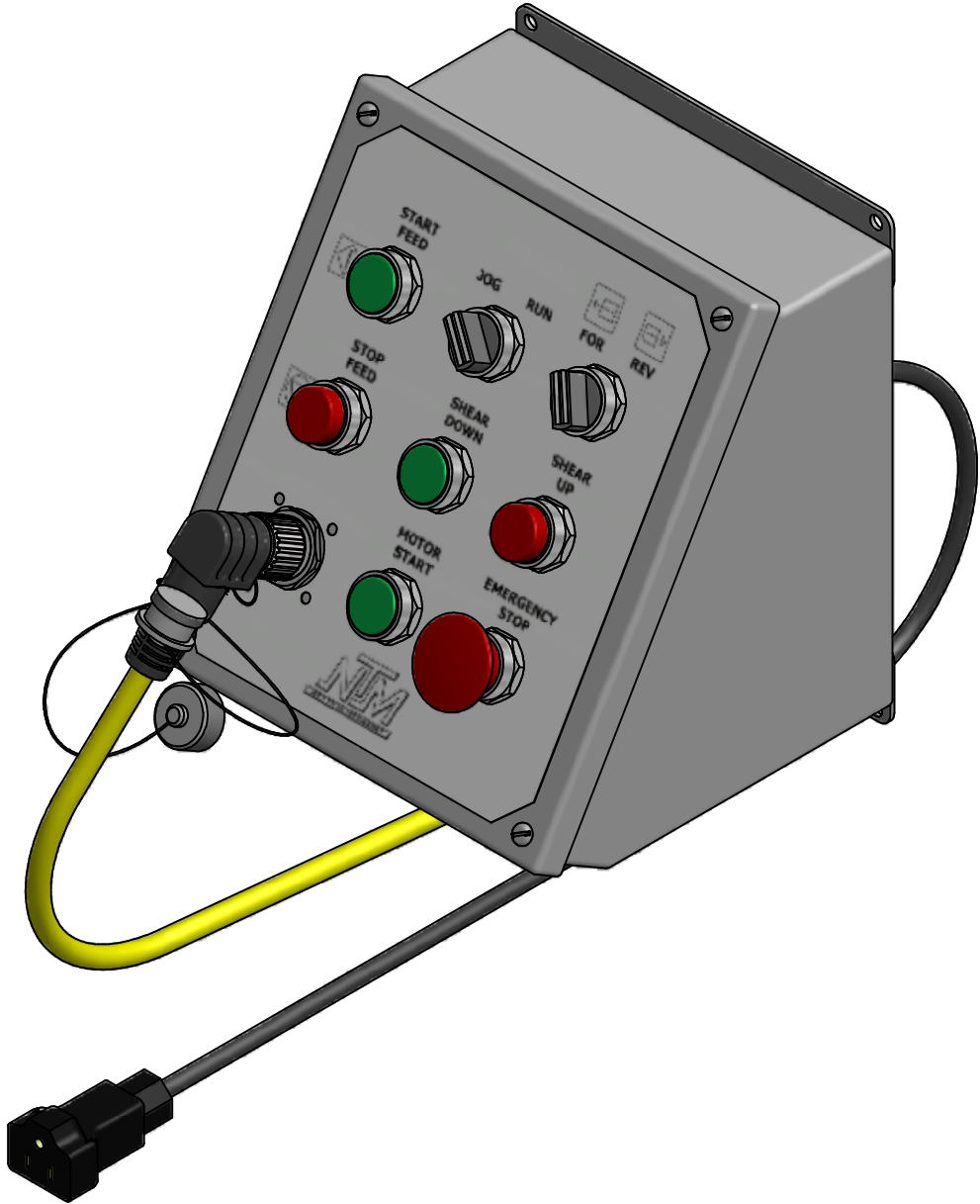
NOTE: UNLESS OTHERWISE SPECIFIED.  
1. R=.015

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						.XX = ± .01	DATE				
						.XXX = ± .005					
						FRACTION = ± 1/32"	CHECK BY	PART NUMBER		SHEET	
						ANGLE = ± 1/2'	DATE	PLC-380-000		2 OF 2	
									REVISION	1	

PARTS LIST			
ITEM	QTY	PART NUMBER	TITLE
1	1	DCL-100-017	DECAL, ASSEMBLED IN MEXICO
2	1	ELC-100-017	FEMALE CLOSURE CAP
3	1	ELC-100-018	MALE CLOSURE CAP
4	1	ELC-100-021	ENCLOSURE
5	1	ELC-110-000	TERMINAL BLOCK/RELAY ASSEMBLY
6	3	ELC-300-103	PUSH BUTTON, GREEN
7	1	ELC-300-104	SELECTOR SWITCH, W/1 N.O.
8	2	ELC-300-107	PUSH BUTTON, RAISED RED
9	1	ELC-300-109	SELECTOR SWITCH, 2 POS,1 N.O. 1 N.C.
10	2	ELC-300-114	1" MOUNTING BASE (NOT SHOWN)
11	1	ELC-400-017	IDEC #HW-C10 N/O CONTACT BLOCK
12	1	ELC-400-018	IDEC #HW-C01 N/C CONTACT BLOCK
13	2	ELC-400-045	HOLE SEAL, 1/2" KO
14	1	ELC-400-046	LEXAN OVERLAY, PANEL
15	1	ELC-400-061	BUTTON, MUSHROOM, PUSH/PULL
16	1	ELC-425-020	STRAIN RELIEF, 1/2" NPT
17	1	ELC-450-006	STRAIN RELIEF, 1/2" NPT .10-.30"
18	4	FAS-NUY-186	NYLOC HEX NUT, #10-32
19	1	FAS-SRM-201	PHILLIPS PAN HEAD SCREW, 10-32 x 3/8"
20	4	FAS-WSF-344	WASHER, FLAT, #10 SAE
21	1	PLC-390-000	PUSH BUTTON BOX WIRE KIT (NOT SHOWN)

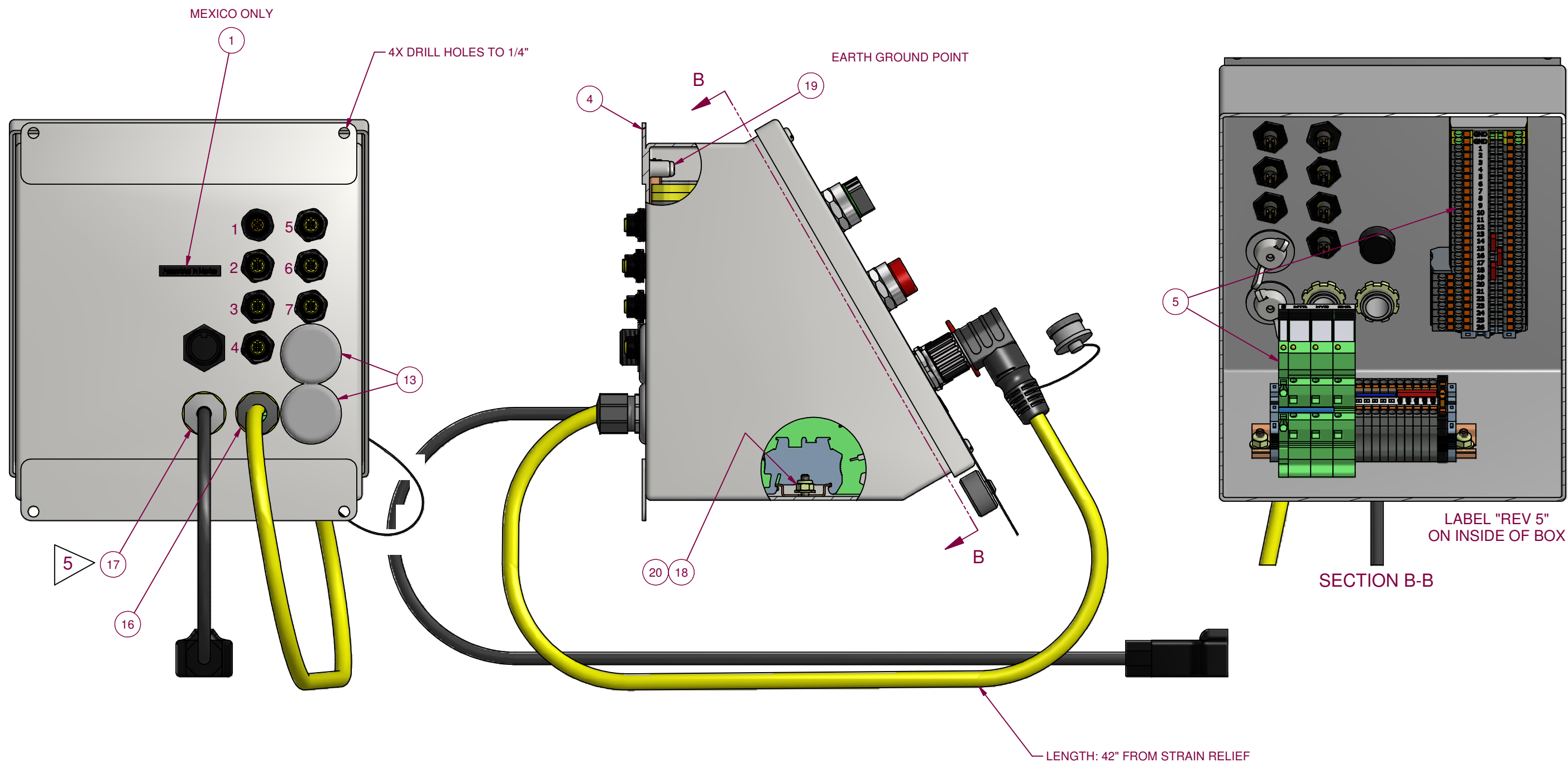
5

REPLACED  
(1) ELC-425-020 WITH (1) ELC-450-006



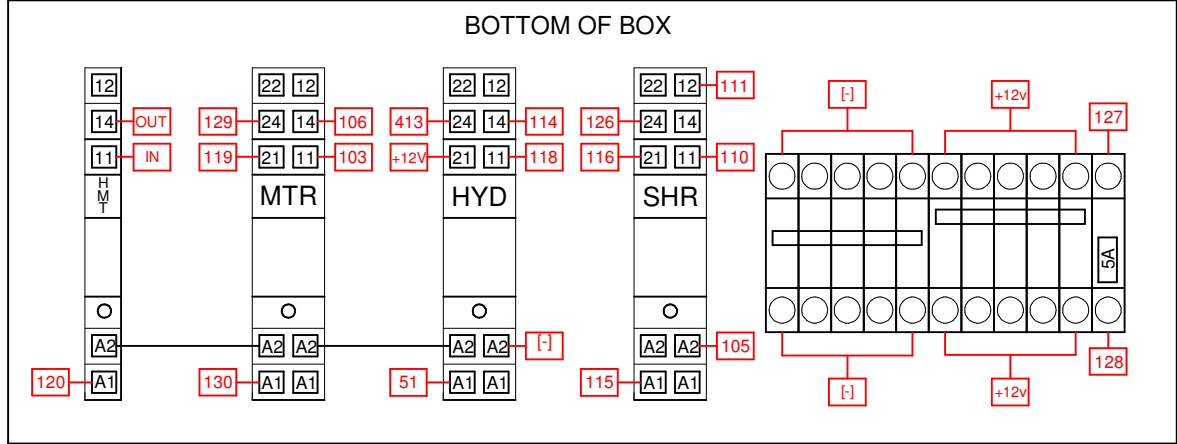
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	1	R-1800	10/20/2011	AJB		.XXX = ± .005	
	2-3	R-1781	3/28/2013	BT		FRACTION = ± 1/32"	
	4	R-1915	08/22/2013	BT		ANGLE = ± 1/2°	
	5	R-1909	09/26/2014	BT			

NEW TECH MACHINERY CORP.			
DRAWN BY BT		PART NAME CONTROL BOX ASSEMBLY	
DATE 01-26-2011		PART NUMBER PLC-381-000	
CHECK BY AJB		SHEET 1 OF 6	
DATE 10/20/2011		REVISION 5	



MATERIAL		SEE BOM		LENGTH	FINISH
REVISION HISTORY	REV	ECR NO.	DATE	RELEASED BY	
					TOLERANCES .XX = ± .01 .XXX = ± .005 FRACTION = ± 1/32" ANGLE = ± 1/2'

NEW TECH MACHINERY CORP.			
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DATE		CONTROL BOX ASSEMBLY	
CHECK BY		PART NUMBER	
DATE		PLC-381-000	REVISION
		SHEET 2 OF 6	5

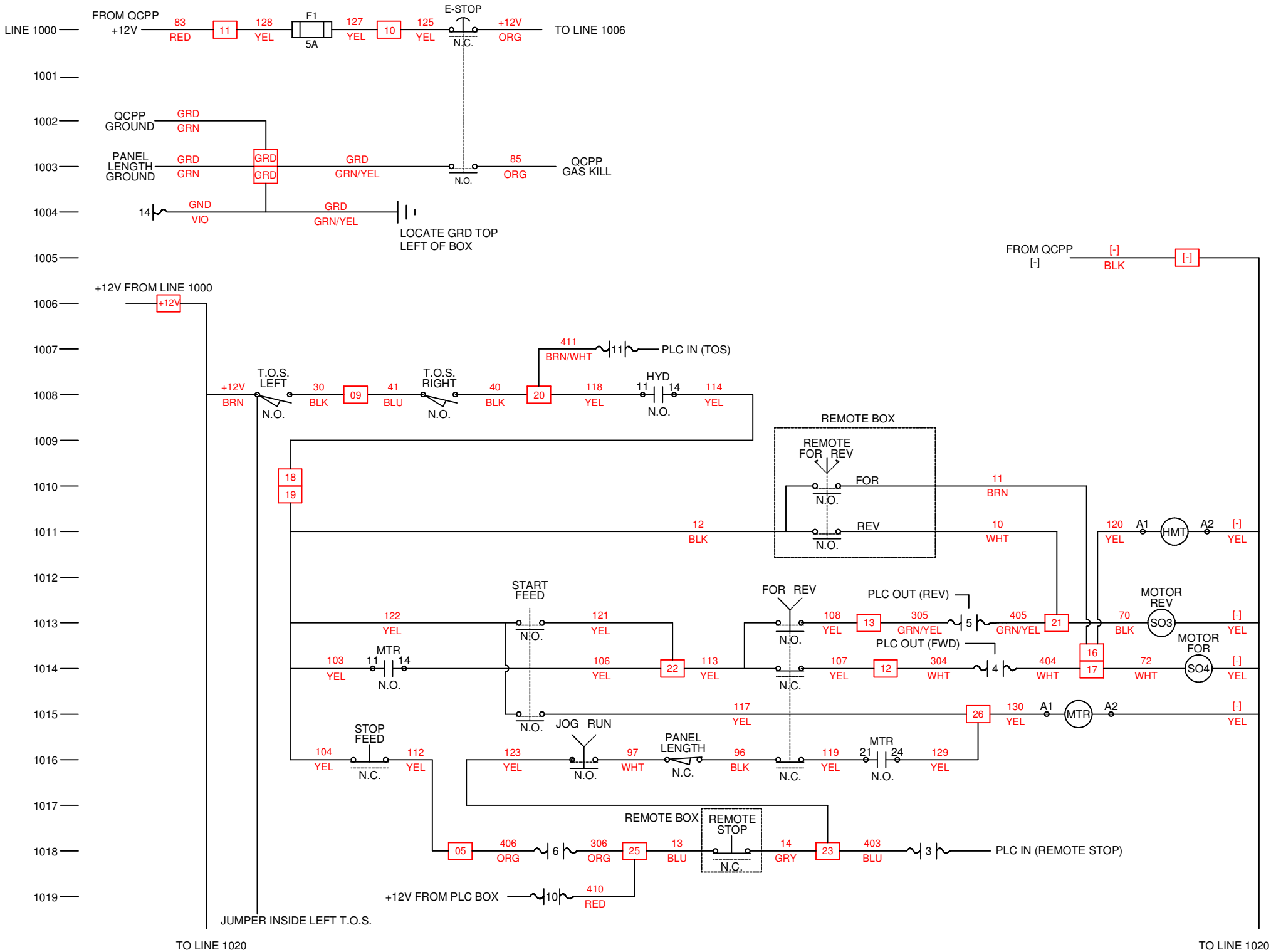


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					.XXX = ± .005
					FRACTION = ± 1/32"
					ANGLE = ± 1/2°

 <b>NEW TECH MACHINERY CORP.</b>	
DRAWN BY	PART NAME
DATE	<b>CONTROL BOX ASSEMBLY</b>
CHECK BY	
DATE	PART NUMBER
	<b>PLC-381-000</b>
	SHEET
	<b>3 OF 6</b>
	REVISION
	<b>5</b>

LEGEND

	TERMINAL BLOCK
	PIN NUMBER
	FUSE
	CONTACT (N.O.)
	CONTACT (N.C.)
	MUSHROOM HEAD PUSH BUTTON (N.O.)
	MUSHROOM HEAD PUSH BUTTON (N.C.)
	PUSH BUTTON (N.O.)
	PUSH BUTTON (N.C.)
	LIMIT SWITCH (N.O.)
	LIMIT SWITCH (N.C.)
	PRESSURE SWITCH (N.O.)
	PRESSURE SWITCH (N.C.)
	CONTROL RELAY COIL
	SOLENOID RELAY COIL
	SELECTOR SWITCH
	SPRING RETURN SELECTOR SWITCH
	MOMENTARY SWITCH
	ROTARY ENCODER



MATERIAL			LENGTH	FINISH	
SEE BOM					
REVISION HISTORY	REV	ECR NO.	DATE	RELEASED BY	TOLERANCES
					.XX = ± .01
					.XXX = ± .005
					FRACTION = ± 1/32"
					ANGLE = ± 1/2'



NEW TECH MACHINERY  
CORP.

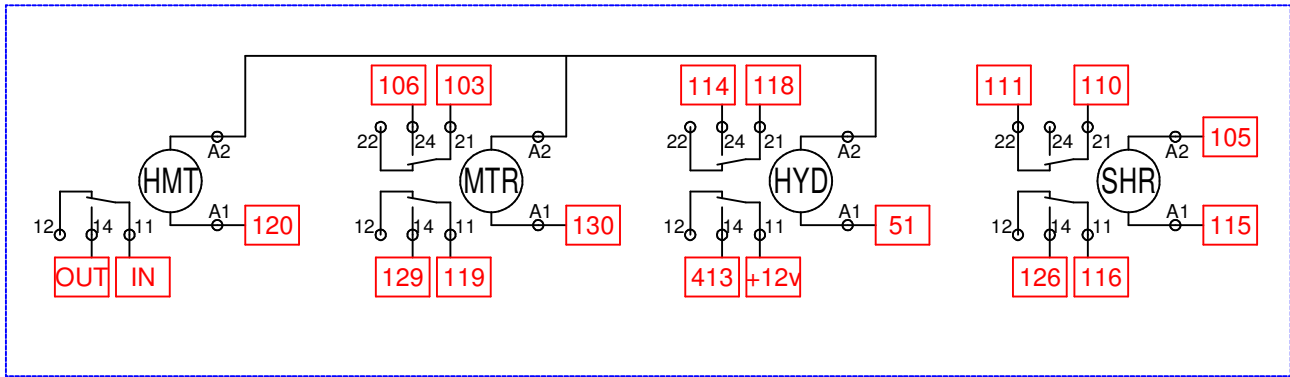
DRAWN BY	PART NAME
DATE	CONTROL BOX ASSEMBLY
CHECK BY	PART NUMBER
DATE	PLC-381-000

SHEET	REVISION
4 OF 6	5

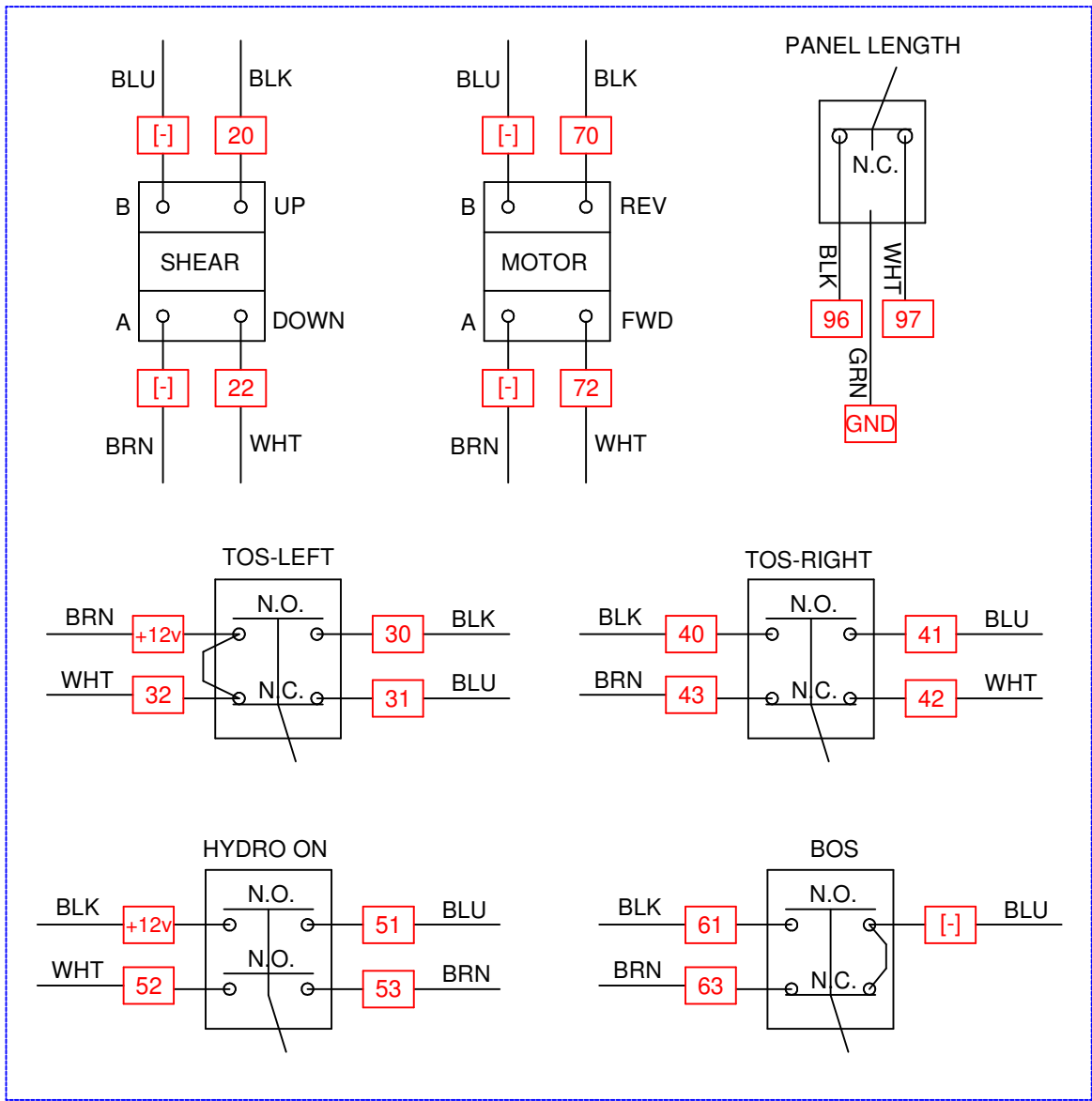




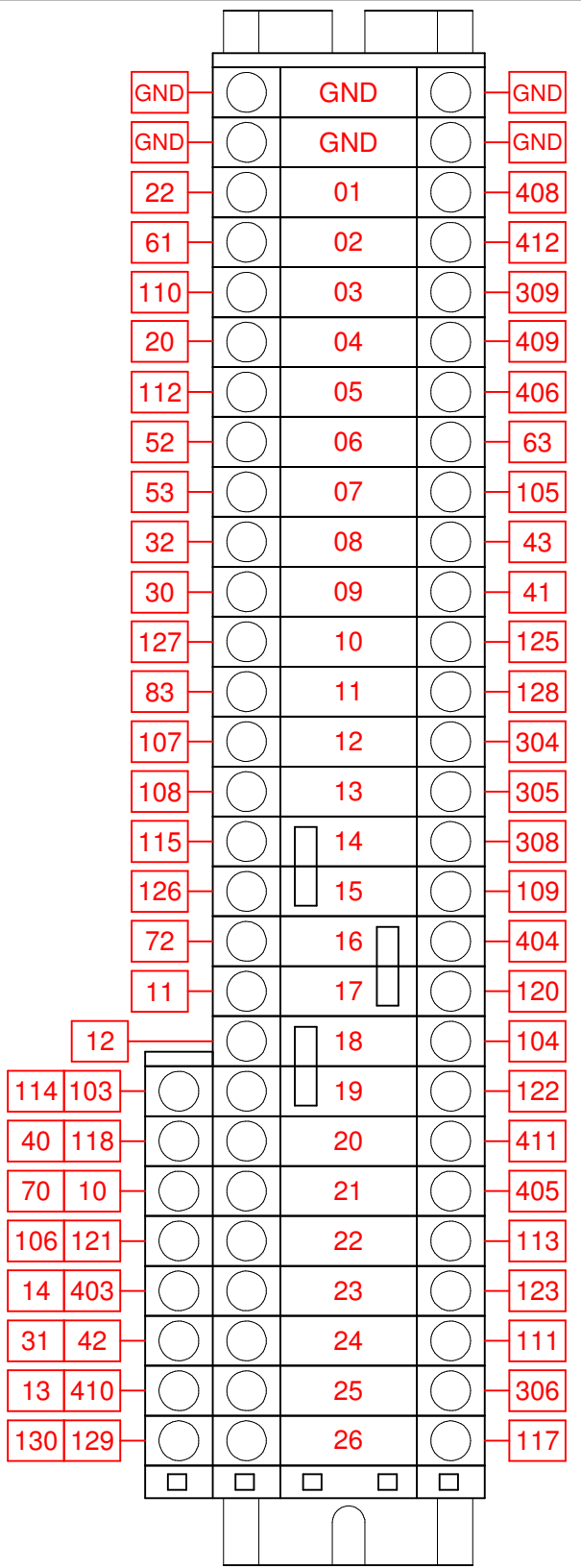
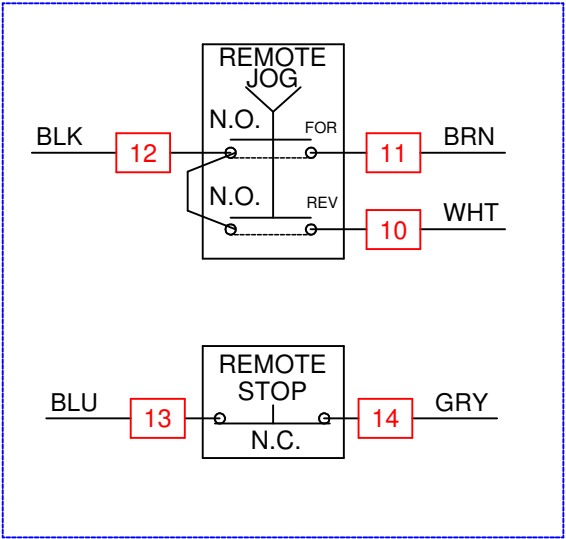
CONTROL RELAYS



COMPONENTS



ENTRY END/REMOTE CONTROL



MATERIAL					LENGTH		FINISH		NEW TECH MACHINERY CORP.			
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REVISION HISTORY	REV	ECR NO.	DATE	RELEASED BY	TOLERANCES			DRAWN BY	PART NAME			
					.XX = ± .01			DATE				
					.XXX = ± .005			CHECK BY	PART NUMBER			
					FRACTION = ± 1/32"			DATE	PLC-381-000			
					ANGLE = ± 1/2'					SHEET		REVISION
									6 OF 6		5	





**New Tech Machinery**  
A MAZZELLA COMPANY

16265 E. 33rd Dr. Ste 40 | Aurora, CO 80011

303-294-0538 | 800-574-1717 | Fax: 303-294-9407

[www.NewTechMachinery.com](http://www.NewTechMachinery.com)

SSH-MAN-PLC | Revision 9 | 04-07-2022