



SINCE 1991

5VC-5V Crimp

Roof Panel Machine OPERATION and MAINTENANCE MANUAL



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TABLE OF CONTENTS

CHAPTER 1.....	SPECIFICATIONS.....	1
CHAPTER 2.....	PRECAUTIONS.....	2
CHAPTER 3.....	MACHINE ORIENTATION.....	3
CHAPTER 4.....	GENERAL MAINTENANCE.....	5
	Recommended Lubricants and Fluids:.....	6
CHAPTER 5.....	ELECTRICAL CONTROLS AND OPERATION.....	8
CHAPTER 6.....	REEL STANDS, REELS AND EXPANDABLE ARBORS.....	15
CHAPTER 7.....	HYDRAULIC SYSTEM.....	20
CHAPTER 8.....	DRIVE SYSTEM.....	22
CHAPTER 9.....	WIDTH CHANGE PROCEDURE.....	26
	Forming Roller Adjustment.....	26
	Entry Guide Adjustment.....	27
	Entry Drum Adjustment.....	29
	Shear Adjustment.....	29
	Arbor Adjustment.....	33
	Loading Machine with Material.....	34
CHAPTER 10.....	MACHINE ADJUSTMENT.....	36
CHAPTER 11.....	ROLLER SYSTEM AND PANEL PROFILE DRAWINGS.....	40
CHAPTER 12.....	RUN OUT TABLES AND REMOTE LIMIT SWITCH.....	44
CHAPTER 13.....	QUICK CHANGE POWER PAC.....	47
CHAPTER 14.....	TROUBLESHOOTING.....	48
APPENDIX A.....	COMPUTER BATCH AND LENGTH CONTROLLER.....	1
	Introduction.....	2
	Manual Operations.....	3
	Production Procedures.....	3
	Administrative Screens and Functions.....	6
	Troubleshooting.....	7
APPENDIX B.....	ELECTRICAL SCHEMATICS.....	1

LIST OF FIGURES

Figure 1: Machine Overview	3
Figure 2: Mounting Dimensions	4
Figure 3: Clean Entry Guide	7
Figure 4: Controls	11
Figure 5: Main Control Cable	12
Figure 6: Run Out Table and Remote Limit Switch	13
Figure 7: Main Control Box Fuse	13
Figure 8: QCPP E 1-6 Fuse Location	14
Figure 9: Expandable Arbor Set-Up	16
Figure 10: Expandable Reel Assembly	17
Figure 11: Material Routing	19
Figure 12: Hydraulic System Overview	21
Figure 13: Drive Roll Assembly Views	23
Figure 14: Gears and Shafts	24
Figure 15: Chains, Upper and Lower	25
Figure 16: Width Change Fasteners	27
Figure 17: Entry Guide Adjustment	28
Figure 18: Entry Guide Positions	28
Figure 19: Entry Drum	29
Figure 20: Shear Assembly	32
Figure 21: Shear Assembly Details	33
Figure 22: Feeding Material into Entry Guides	34
Figure 23: Downhill Adjustment	37
Figure 24: 5VC Setup Sheet	38
Figure 25: 5VC Roller System	40
Figure 26: 5VC 21" Width	41
Figure 27: 5VC 24" Width	42
Figure 28: 5VC 24½" Width	43
Figure 29: Run Out Table	45
Figure 30: Run Out Table Setup	46
Figure 31: Quick Change Power Pac	47
Figure 32: Pressure Switch Adjustment	48
Figure 33: Top of Stroke Limit Switch	50
Figure 34: Limit Switch Adjustment	50
Figure 42: AMS Box Without Cables	1
Figure 43: AMS Box With Cables	2
Figure 44: AMS Controls MP465 Controller	2

CHAPTER 1
5VC SPECIFICATIONS

SPECIFICATIONS

5VC Dimensions:	Length-10' 5"	(3.2m)
	Width-3' 10"	(1.2m)
	Height-4' 3"	(1.3m) w/Over Head Rack
	2' 4"	(.75m) w/o Over Head Rack
	Weight-2700 lbs.	(1230kg)
5VC on Trailer:	Length-17' 6"	(5.3m)
	Width-7'	(2.1m)
	Height-6' 3"	(1.9m) with reel
	Weight-4700 lbs.	(2140kg)
Speed:	60 ft/min. Approx.	(18m/min.) Approx.
Drive:	Hydraulic via chain, sprocket and gear using 8 polyurethane drive rollers.	
Shear:	Hydraulically Powered, Infinitely adjustable, hardened tool steel dies and blades with Panel Recognition Proximity Sensor	
Hydraulic Fluid:	15 Gallons - 32AW	
Coil Width	24", 27" or 27½" (610mm , 686mm, or 699mm)	
Finished Panel Width	21" and 24" (533mm and 610mm)	
Materials Formed	Painted Steel	30ga. to 24ga. (.3mm to .6mm) Painted, Galvanized, Aluminized
	Painted Aluminum	.019" to .040" (.5mm to 1.0mm)
	Copper	16 oz. to 20 oz. ¾ Hard (.5mm to .7mm)
Controls	Standard:	12VDC Manual Control Box w/Length Control Limit Switch
	Optional:	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

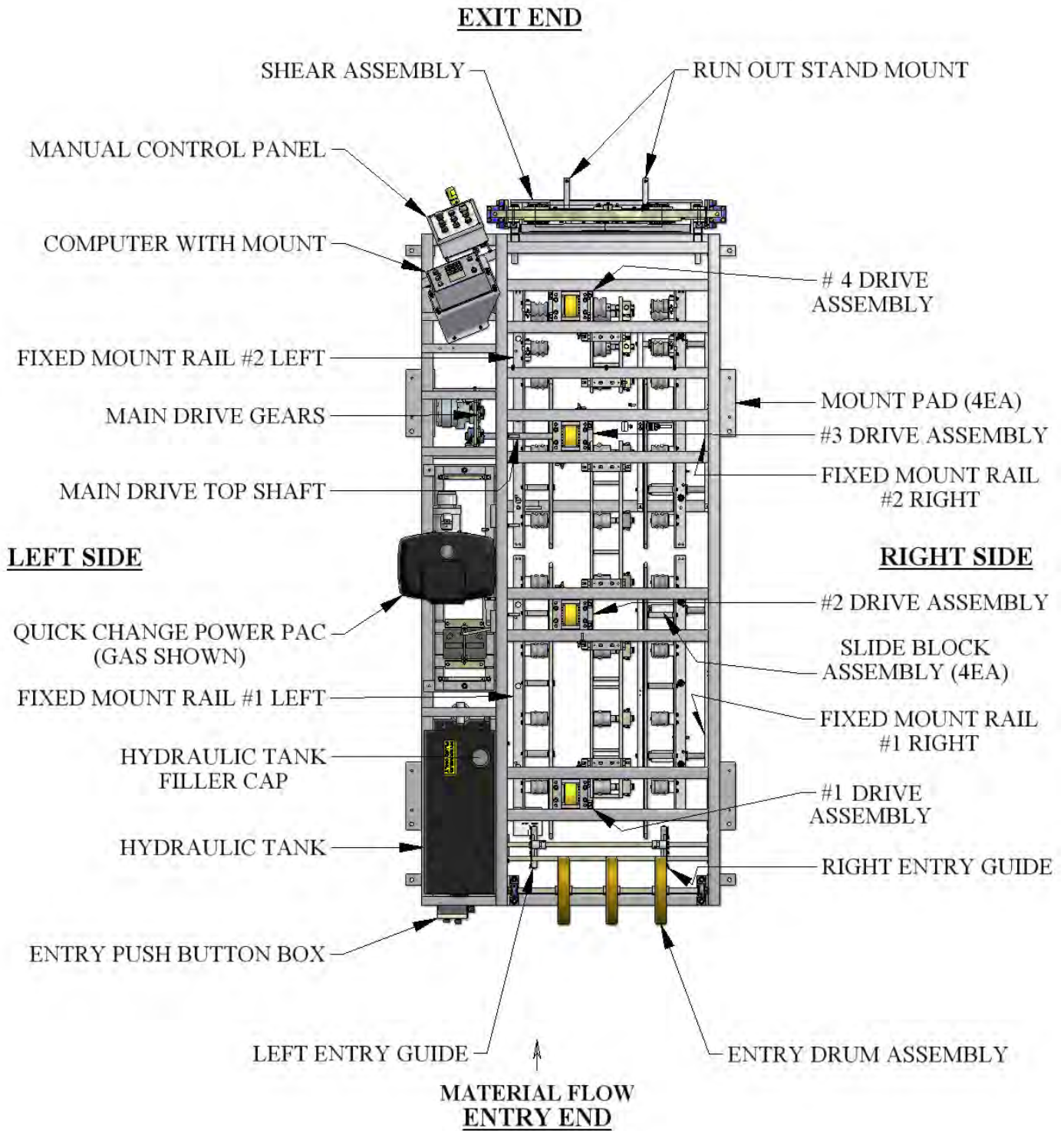


Figure 1: Machine Overview

CHAPTER 3
MACHINE ORIENTATION

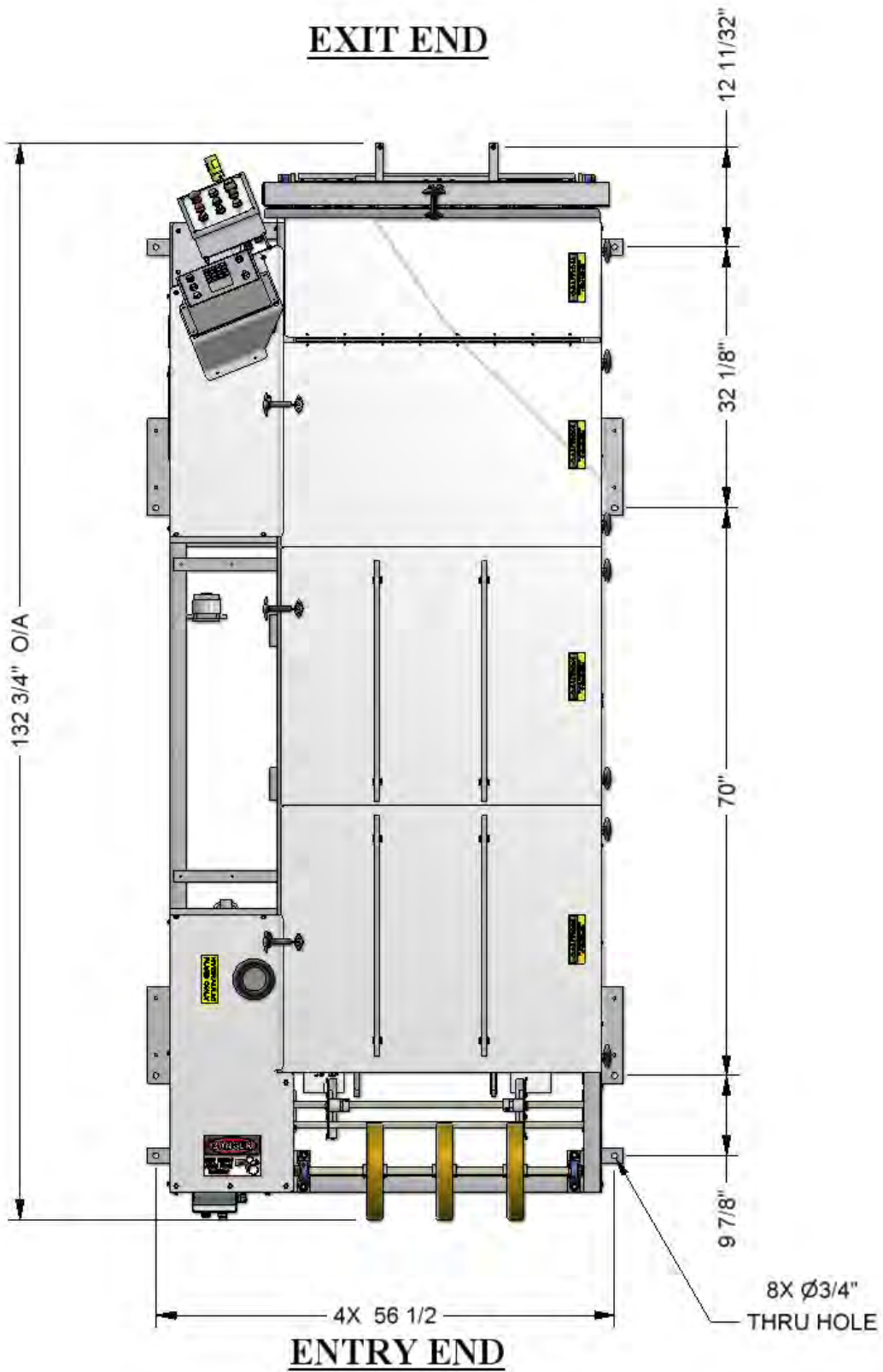


Figure 2: Mounting Dimensions

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 (Figure 3 on page 7).
8. Keep Arbor Cradles (Figure 10 on page 17) lubricated with Clear Grease.
9. Lubricate Arbor Nut (Figure 9 on page 16) using a grease gun with EP Grease when threads begin to look dry.
10. Clean Forming Rollers as needed with a Scotch Brite Pad and a small amount of solvent.
11. 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.**
12. Lubricate both faces of the Shear Blades and Dies (Figure 20 on page 32) 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, Dies, Bead Roller Carriage Shafts, Acme Shafts and Mitre Gears

Super Lube - Multi-Purpose Synthetic Aerosol Lubricant with Synolon (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 Synolon (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:

MSC Supply at 1-800-645-7270

Spray Lube for:

Chains

Super Lube – Multipurpose Synthetic Dri Film Aerosol Lubricant with Synolon (PTFE)

Catalog No. 11016

11oz Aerosol Can

Available from:

MSC Supply at 1-800-645-7270

Hydraulic Fluid (32AW) for:

Hydraulic Tank

Various Manufacturers

CHAPTER 4
GENERAL MAINTENANCE

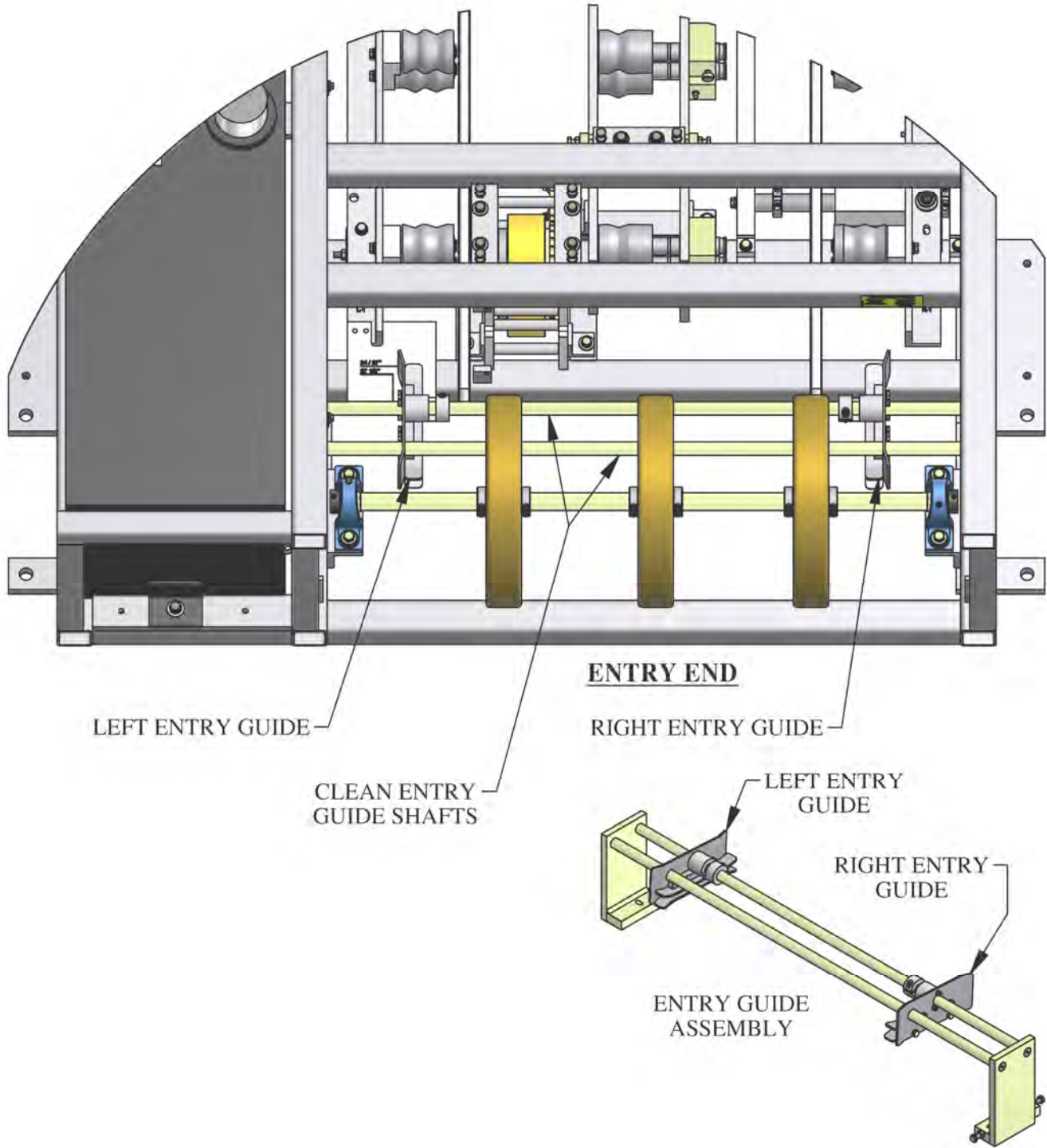


Figure 3: Clean Entry Guide

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 the 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:

(See Figure 4)

- 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.
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 will be ready to run panel.
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 at Entry and Exit End)
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 at Entry and Exit End)
This button acts as an emergency stop for the drive system when using the Length Control Limit Switch. **Pressing either the entry or exit button will stop the drive system of the machine in case of an emergency.**
- 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
- F. SHEAR UP (Red button)
Pressing this button during the down cycle of the shear will immediately send it back to the top or home position.
- G. EMERGENCY STOP (Raised Red Mushroom button)

CHAPTER 5
ELECTRICAL CONTROLS AND OPERATION

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 default back to the top 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 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.

MAIN CONTROL CABLE

(See Figure 5)

- A. The main control cable is the communication cable for the Manual Control Panel described above and the PLC 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.

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.

CHAPTER 5
ELECTRICAL CONTROLS AND OPERATION

REMOTE LIMIT SWITCH

(Figure 6)

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 panel length control. It is designed to attach to the right side of the optional Run Out Tables (see page 44) available for the machine. 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 to be 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 let 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. Pull the limit switch back toward the shear until a click is heard in the Limit Switch Head and secure the limit switch at this location. Cut and remove the set up panel from the table. Push the start button and run the next panel allowing the limit switch to stop the machine. Measure this second panel before cutting to determine if it stopped in the correct position and make the necessary adjustment to the limit switch to obtain the desired length. Repeat as necessary.

FUSES

(Figure 7)

All machines, gas or electric powered, have a 10-amp time delay fuse inside the Electrical Control Panel Assembly. This fuse protects the electrical components. If the fuse is blown, all functions of the machine except Motor Start will be inoperable. **To replace this fuse:** Loosen all 4 cover screws and open the front panel of the Control Box. Locate the automotive style in-line fuse near the bottom right hand corner. It is a spring loaded twist lock holder. Push together and turn to open. Check the fuse with a continuity tester. If it is bad, replace with a new fuse and re-connect spring loaded holder.

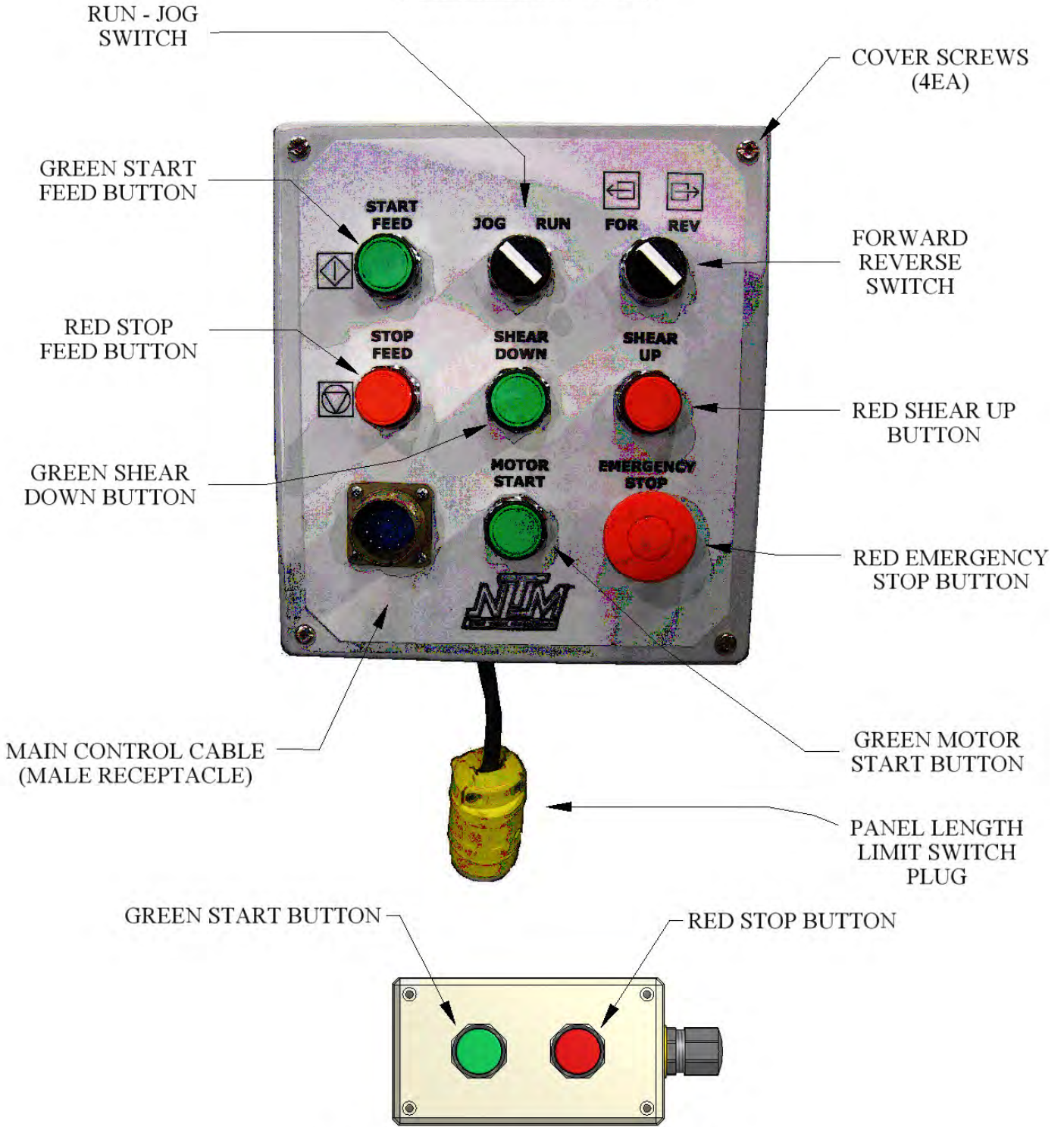
ELECTRIC MOTOR MACHINES

(Figure 8)

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 side or top cover of the contactor box located approximately mid machine on the right side. Access can be gained by removing the center 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

MAIN CONTROL BOX



REMOTE START - STOP (ENTRY END)

Figure 4: Controls

CHAPTER 5
ELECTRICAL CONTROLS AND OPERATION



— MAIN CONTROL CABLE
(FEMALE)

— ENCODER CABLE
(MALE)

Figure 5: Main Control Cable

CHAPTER 5
ELECTRICAL CONTROLS AND OPERATION

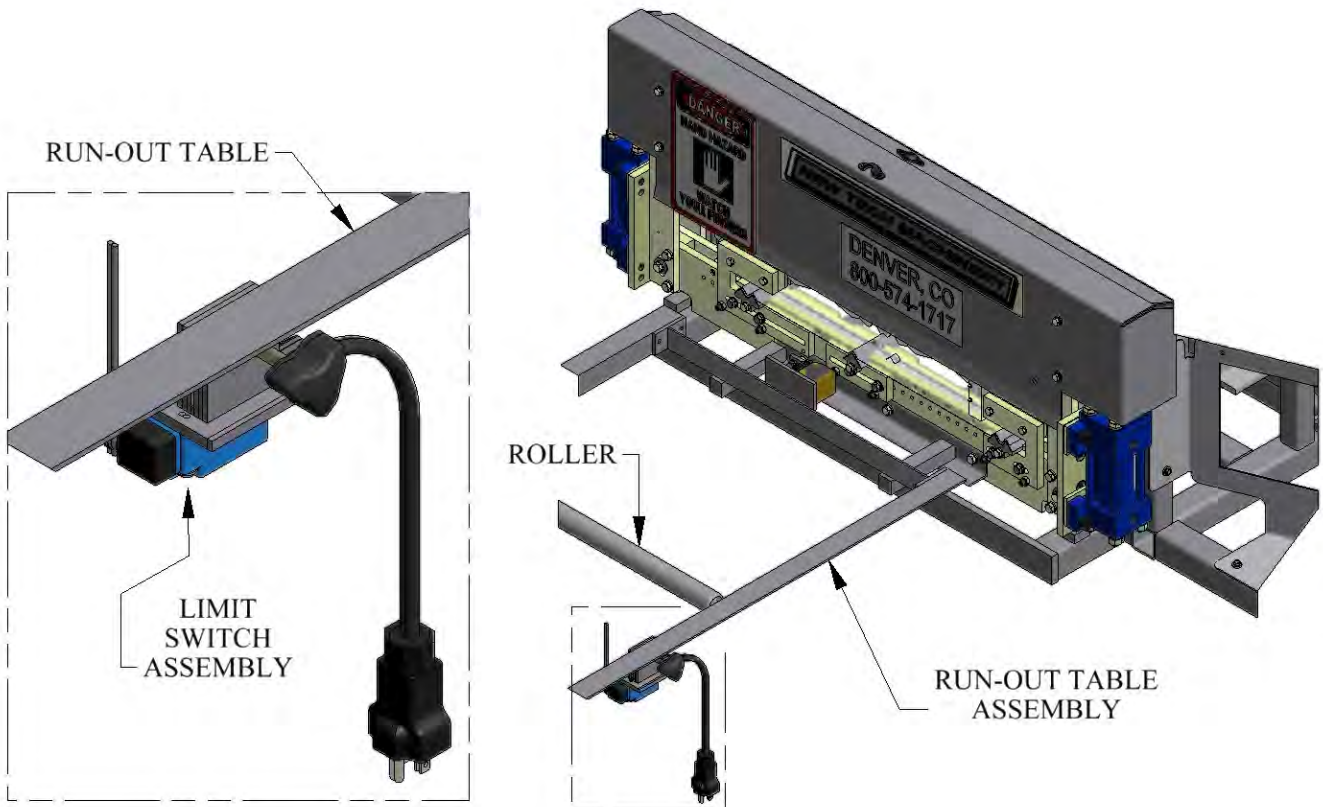


Figure 6: Run Out Table and Remote Limit Switch

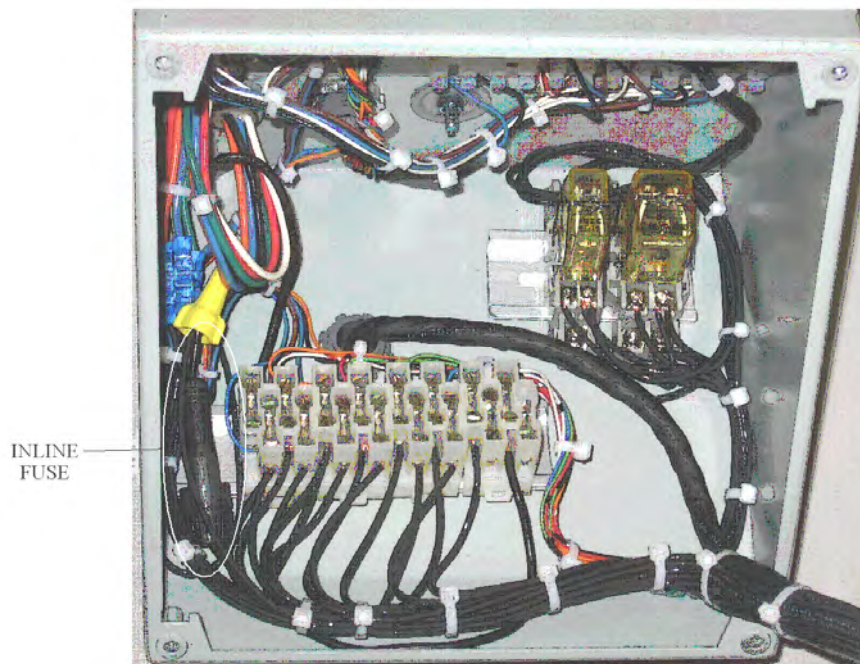


Figure 7: Main Control Box Fuse

CHAPTER 5
ELECTRICAL CONTROLS AND OPERATION

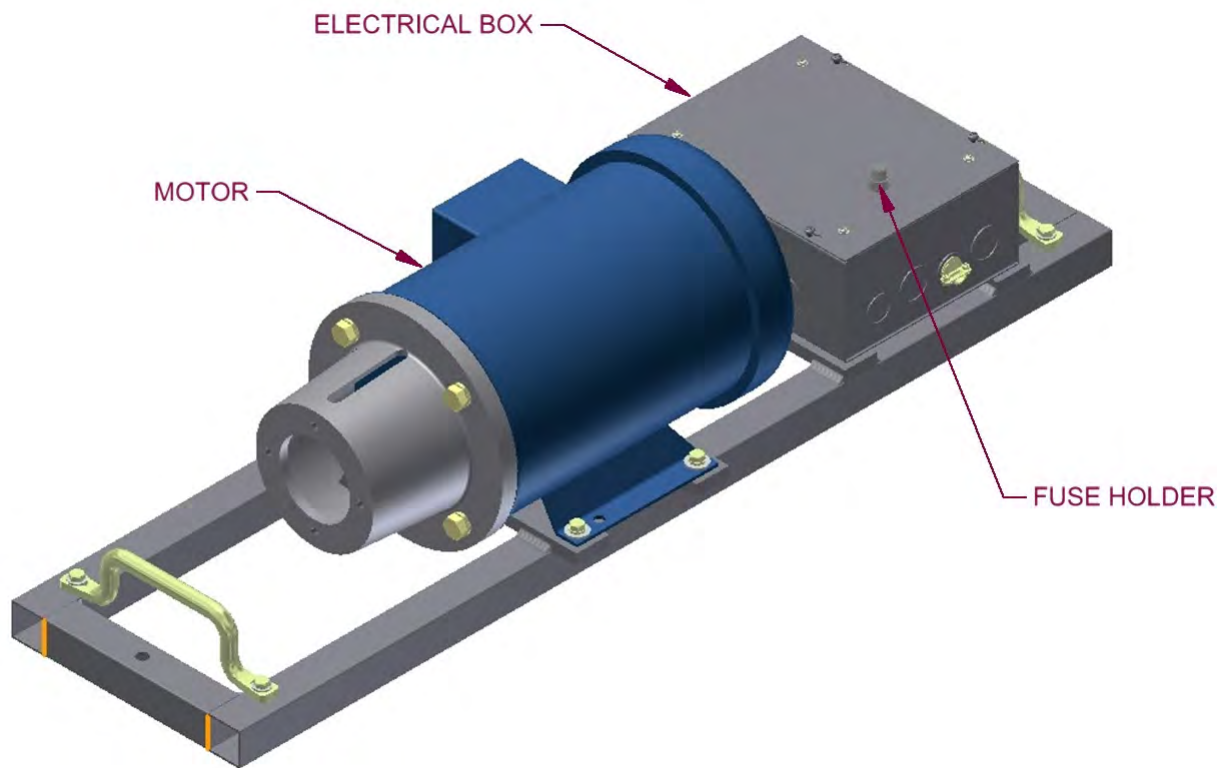


Figure 8: QCPP E 1-6 Fuse Location

CHAPTER 6
REEL STANDS, REELS AND EXPANDABLE ARBORS

REEL STANDS, REELS AND EXPANDABLE ARBORS

EXPANDABLE ARBOR

(Figure 9)

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

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.**

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 under the bottom and pointing toward the exit or shear 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) Bolts “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 Bolts "C" 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 exit end of the machine. See Figure 11
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 9), find the “D” dimension that corresponds to the profile being used.
5. Slide the material on 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 18)

REEL STANDS, REELS AND EXPANDABLE ARBORS

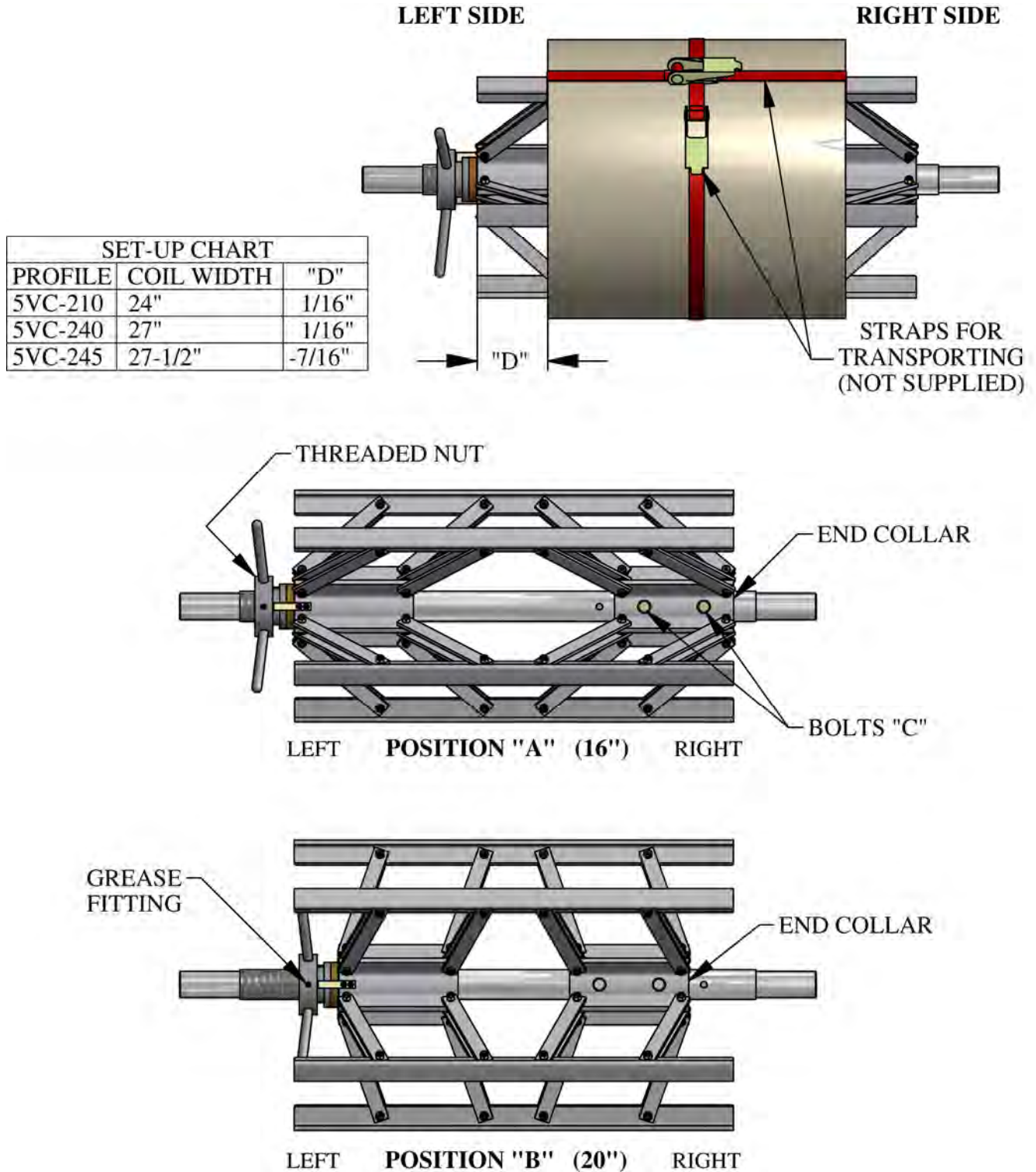


Figure 9: Expandable Arbor Set-Up

CHAPTER 6
REEL STANDS, REELS AND EXPANDABLE ARBORS

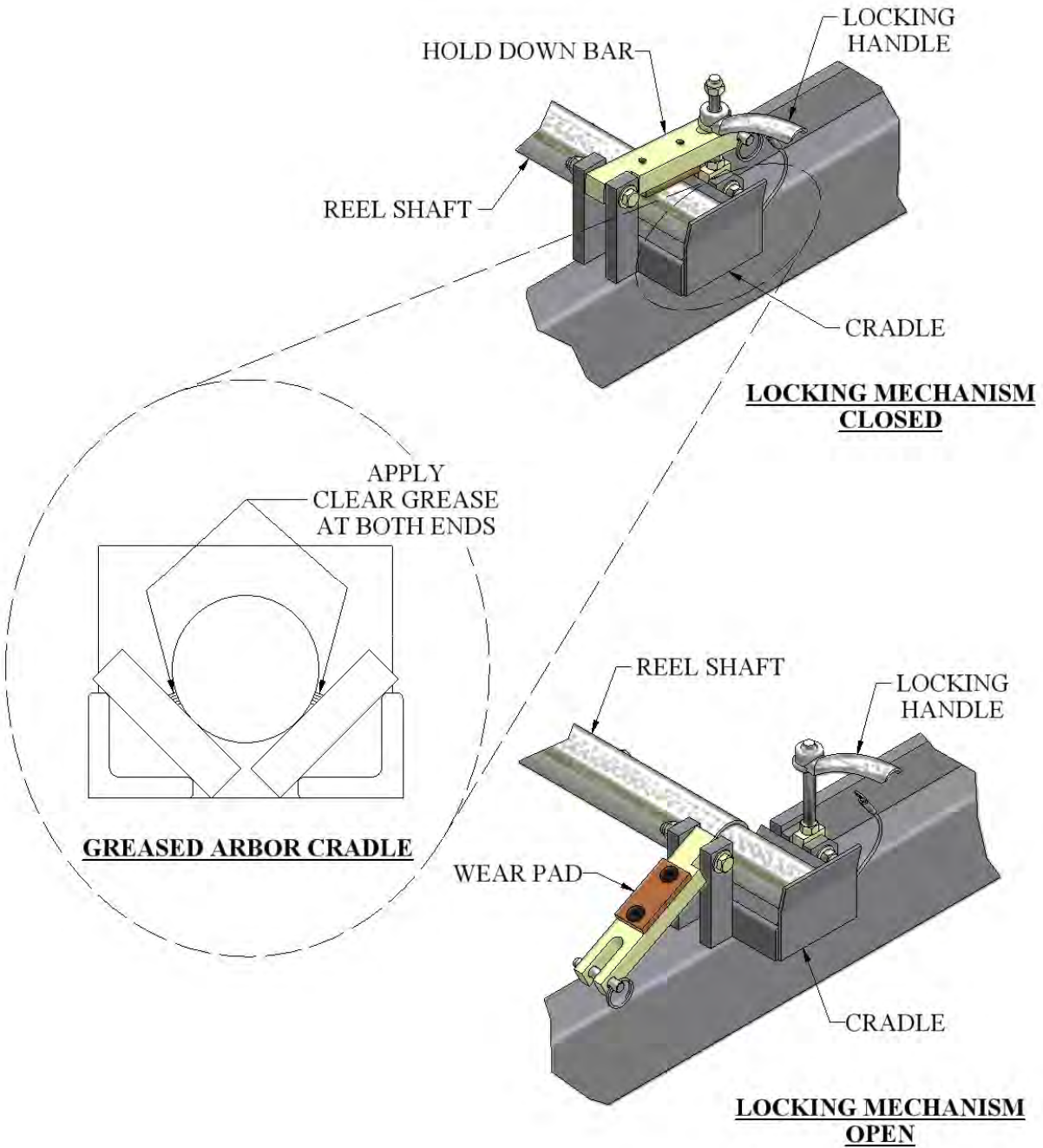


Figure 10: Expandable Reel Assembly

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.

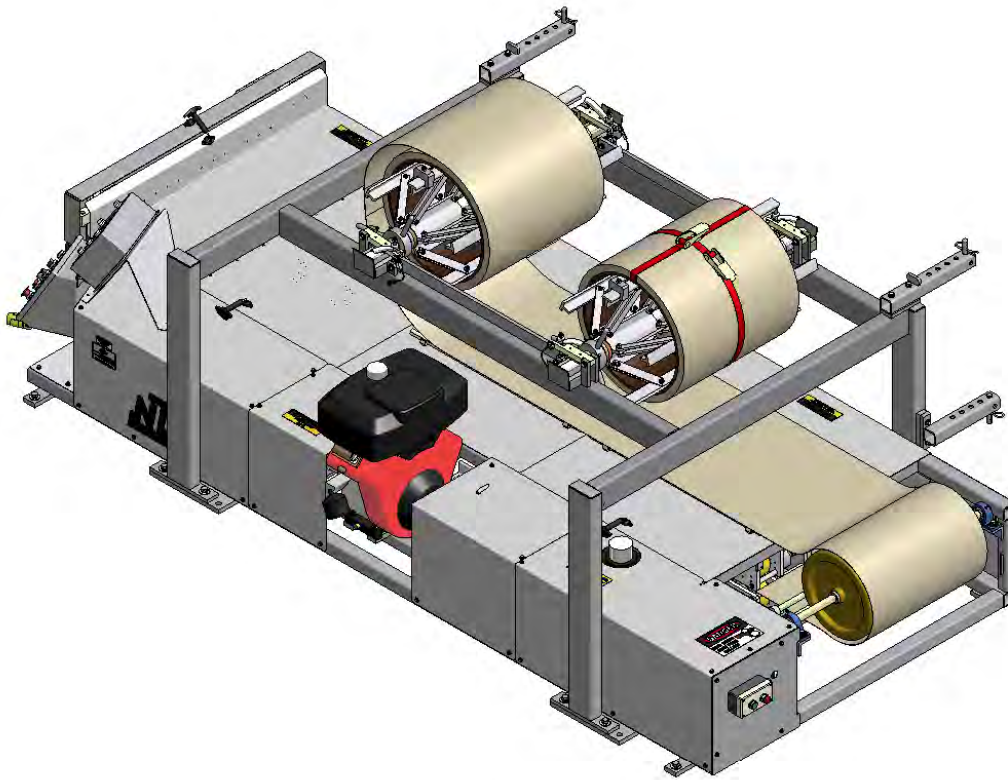
1. Prepare the reel stand by making sure the Hold Down Bars are in the unlocked and open Position (Figure 10).
2. Using an approved lifting device, lift the reeled coil into the cradles on the reel stand making sure that the tail of the coil is in the correct position (Figure 11) then remove the lifting device.
3. Rotate the Hold Down Bars (Figure 10) to the closed position and thread the handle onto the hold down bolt. If material is going to be used from this coil right away, 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-adjustment will need to be made. **Caution: Do Not over tighten Hold Down Bars. Drive and/or electrical system failure may occur.**
4. If the machine will be transported after loading coil, 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, the coil should be secured around the outside edges through the inside diameter using a strap, rope, etc. to prevent the coil from telescoping (Figure 9).

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

OPERATION AND MAINTENANCE

1. The reel shafts must rest in the cradles on the reel rack. Keep the cradles lubricated with synthetic lube to minimize wear. (Figure 10)
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 Bracket should be used to keep the coil from uncoiling too fast during the fabrication of panels. Apply just enough drag to keep coil tensioned. (Figure 10)
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.
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



REMOVE STRAPS FROM COIL PRIOR
TO LOADING MATERIAL IN MACHINE
(STRAPS NOT INCLUDED WITH MACHINE)

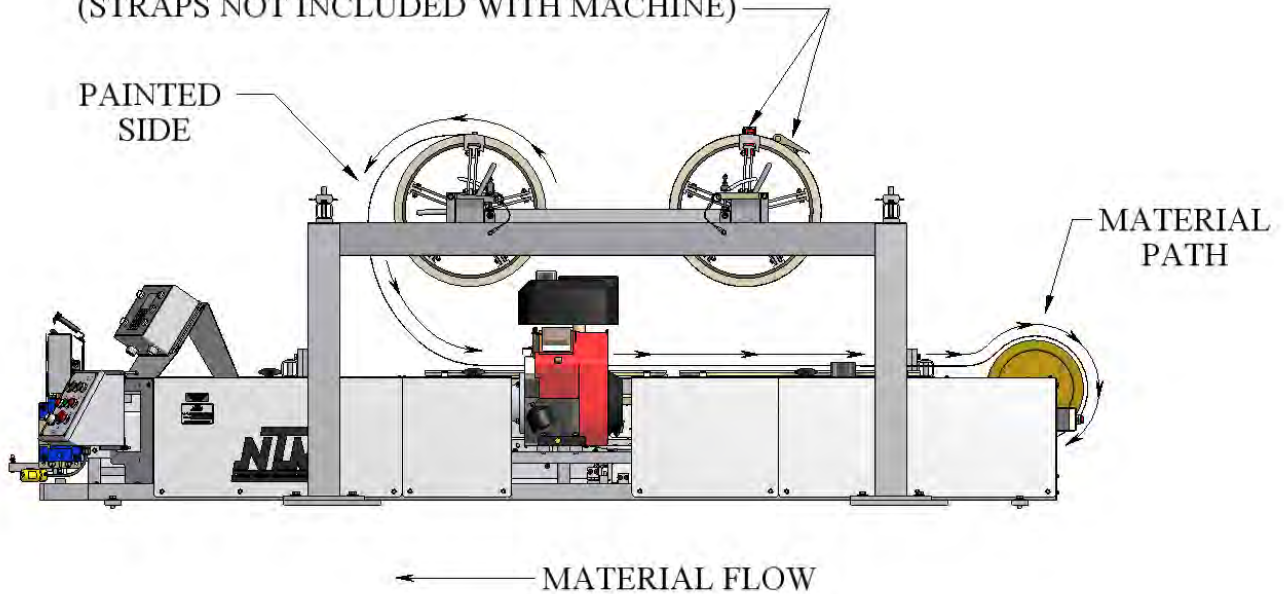


Figure 11: Material Routing

CHAPTER 7
HYDRAULIC SYSTEMS

HYDRAULIC SYSTEM

MAINTANANCE

(Figure 12)

The hydraulic system in the machine is very durable and reliable. It must be properly maintained to ensure trouble free operation and longevity. The factory has installed a 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.
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

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 Left Side Covers and set aside.
2. Remove Filler Cap “E”.
3. Using an external electric or manual pump, pump the hydraulic fluid from the tank. Properly discard used oil.
4. Loosen, remove and discard the used Hydraulic Filter.
5. Re-install the new Hydraulic Filter and fill the tank with fresh 32 weight fluid until it is 5” below the top of the Filler Neck “F”.

CHAPTER 7
HYDRAULIC SYSTEMS

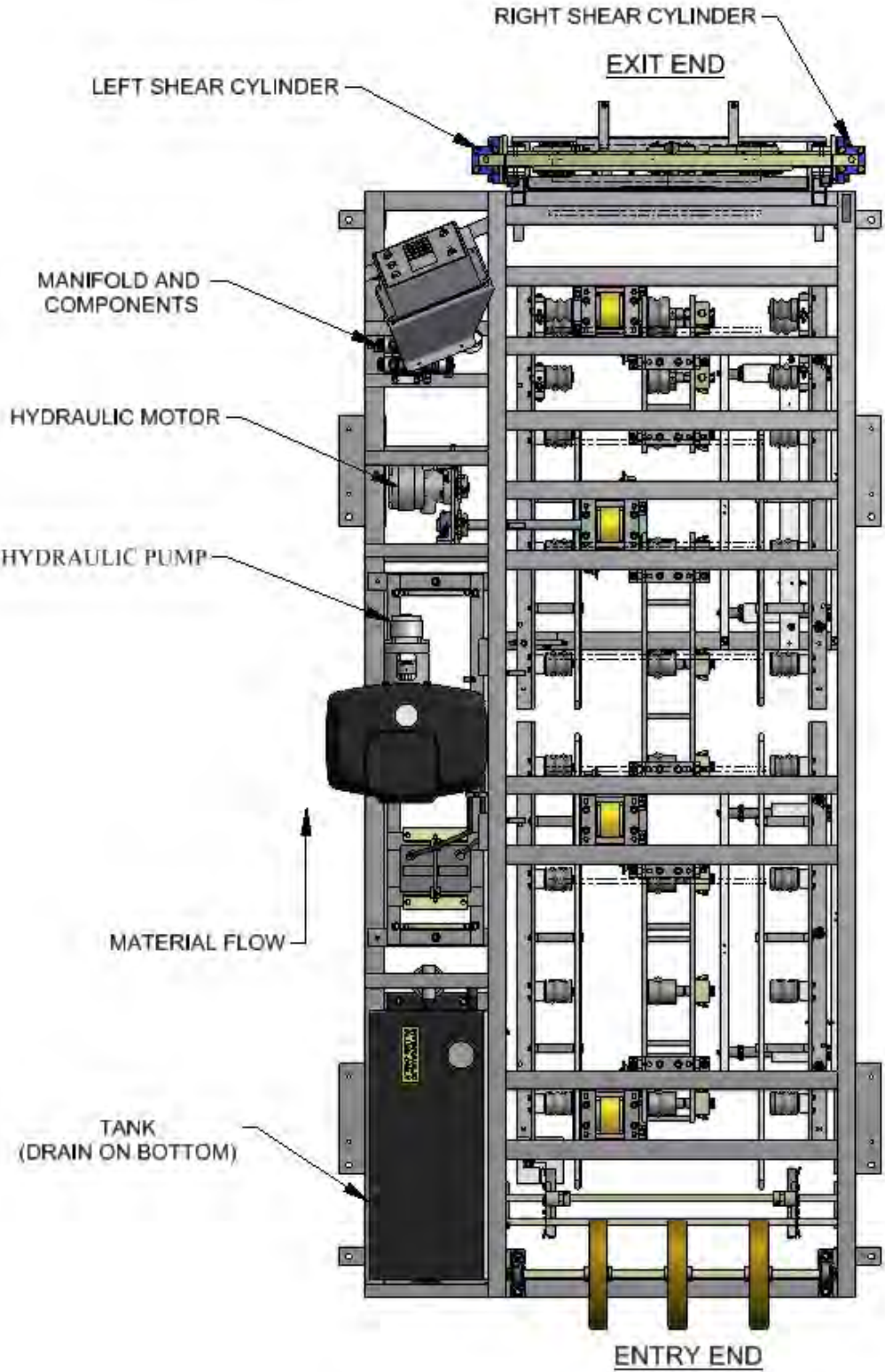


Figure 12: Hydraulic System Overview

CHAPTER 8
DRIVE SYSTEM

DRIVE SYSTEM

(Figure 13 - Figure 15)

The drive system in the machine has four Drive Stations. Each has a top and bottom polyurethane drive roller assembly. They are connected together via #40 roller chain and sprocket and each chain has two tensioner assemblies. The drive system is powered by a Hydraulic Motor which transfers power to the drive assemblies using chain sprockets and a #50 roller chain coupled to a top and bottom drive shaft.

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. though the machine without the need for adjustment. If adjustment becomes necessary due to slippage, pressure can be added. **Do not add more than $\frac{1}{4}$ turn beyond the factory setting.**

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. There are chain tensioner assemblies on each drive roller side plate both top and bottom. To tension chain, slightly loosen the “C” bolt on both tensioners. Loosen the lock nut “D” on both “E” bolts and Tighten “E” bolts evenly until the chain is just snug. Tighten both lock nuts “D” and both “C” bolts.
3. The polyurethane drive rollers will eventually need cleaning. This will become evident when they start leaving a stripe the width of the drive roller on the formed panels that doesn't come off easily or if a material is ran with an oily film on it. 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. **Caution must be taken around the moving parts of the machine during the cleaning process.**

4. 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

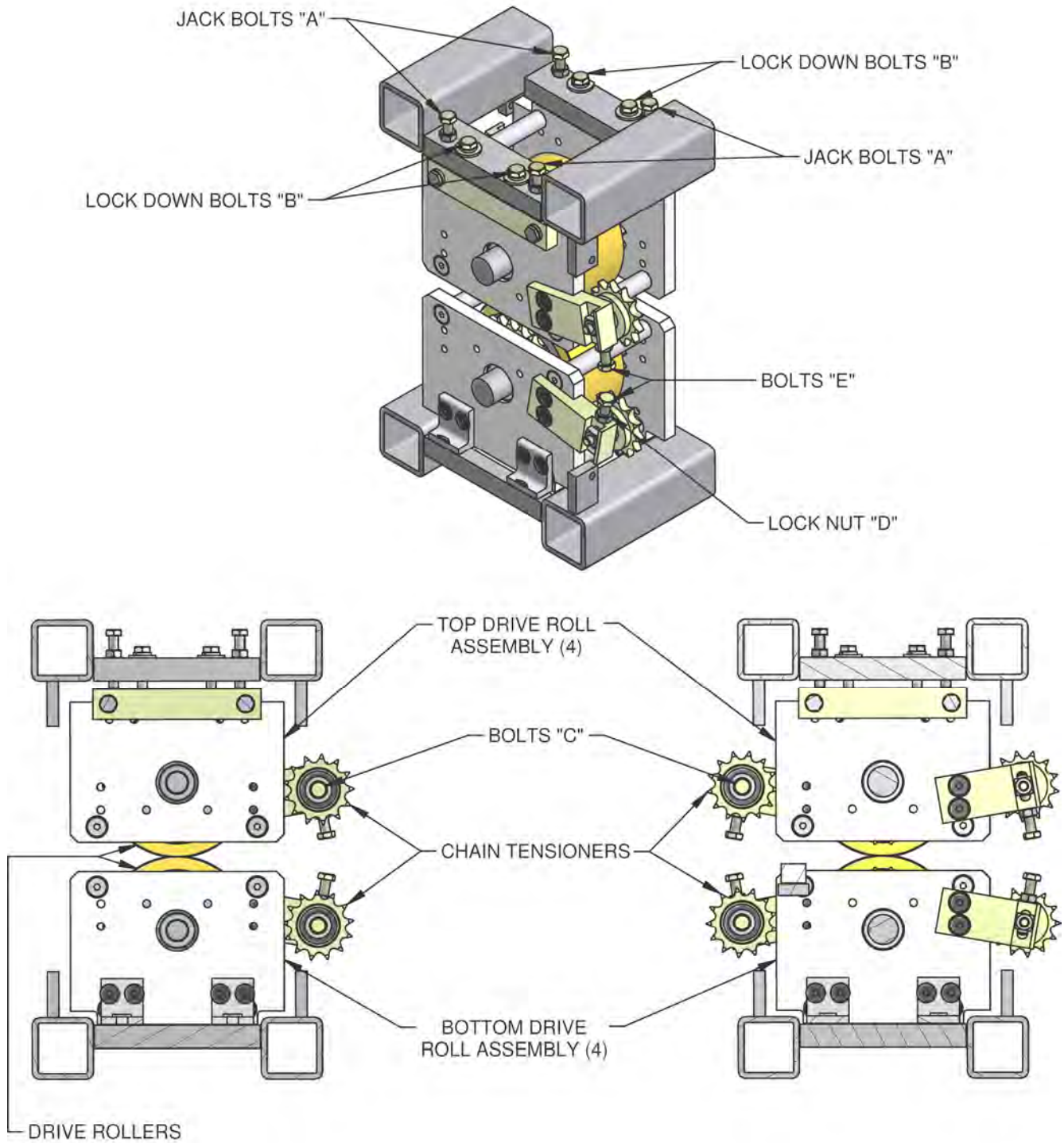


Figure 13: Drive Roll Assembly Views

CHAPTER 8
DRIVE SYSTEM

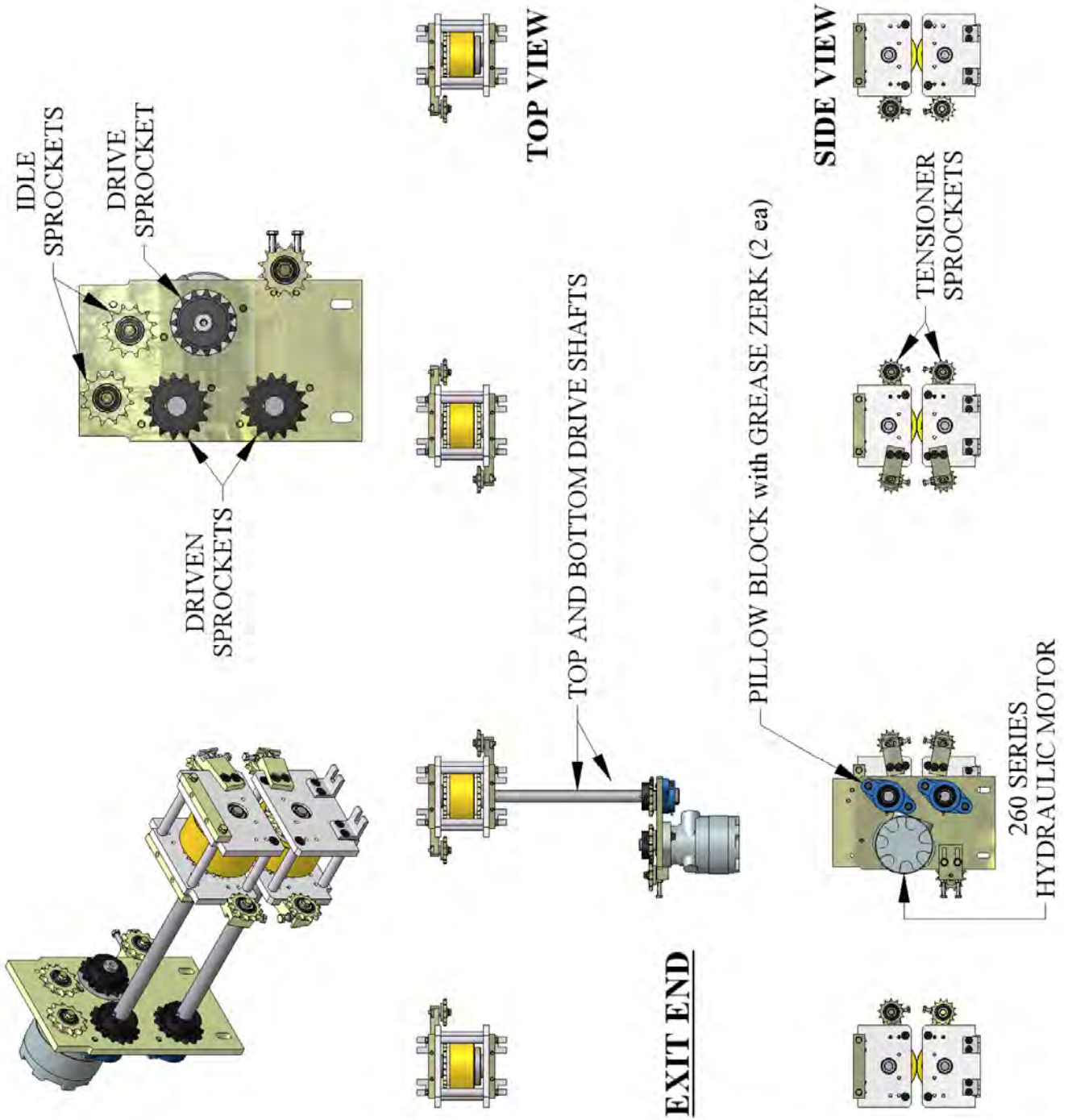


Figure 14: Gears and Shafts

CHAPTER 8 DRIVE SYSTEM

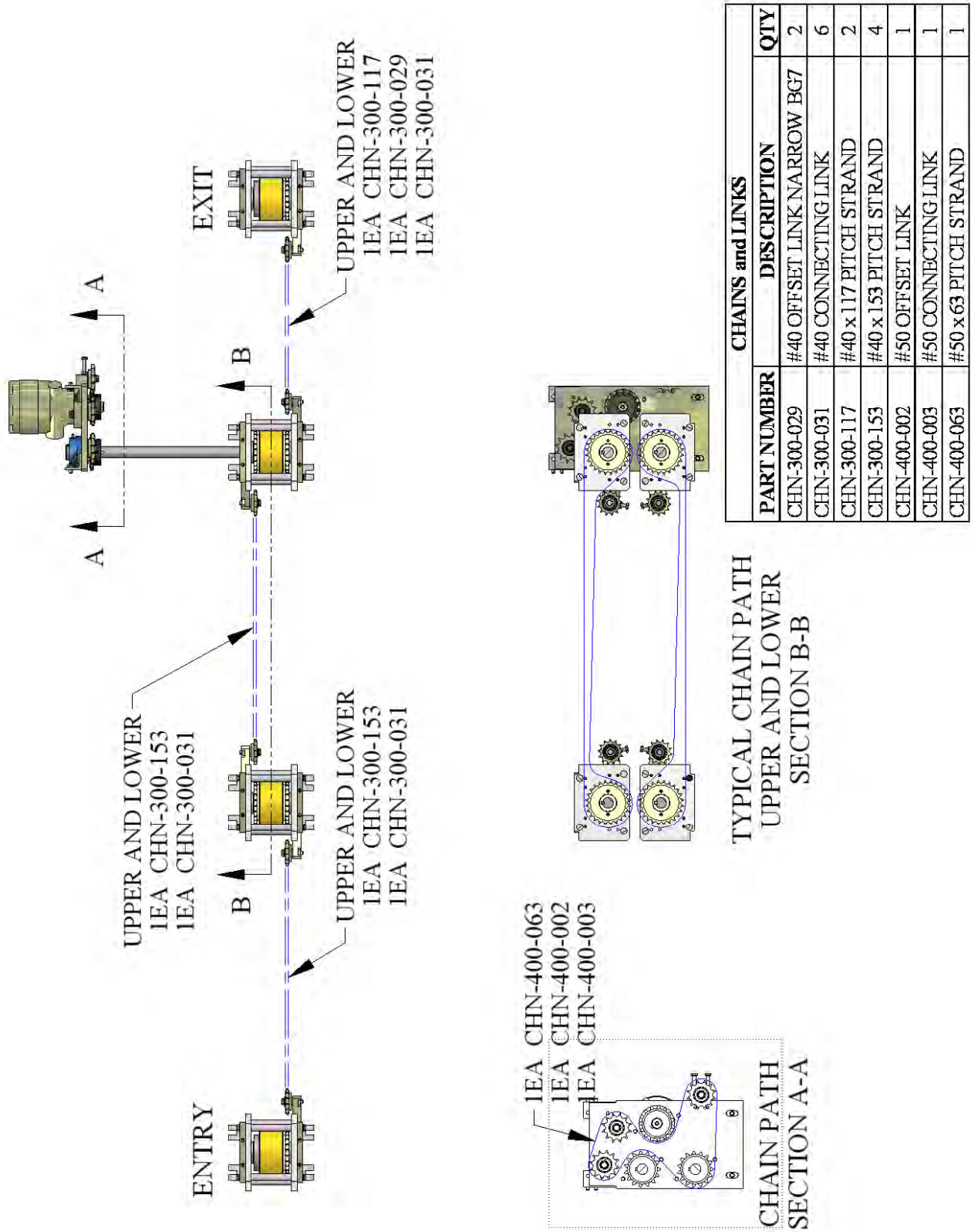


Figure 15: Chains, Upper and Lower

CHAPTER 9
WIDTH CHANGE PROCEDURE

WIDTH CHANGE PROCEDURE

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.

The 5VC machine can run 24", 27" or 27 1/2" material. Machine adjustments will need to be made when changing the width of the material. The width change consists of

1. Adjusting the position of the forming rollers (right and center).
2. Adjusting the position of the entry guides.
3. Adjusting the position of the entry drums.
4. Positioning the material on the expandable arbor.
5. Adjusting the position of the shear dies.

Forming Roller Adjustment

The Left Side tooling is the fixed tooling and does not move when changing the material width. Only the Center and Right Side Tooling change location. The Center Tooling has two positions, to the Left for 24" material and to the Right for 27" or 27-1/2" material. The Right Side Tooling has two positions, to the Left for 24" material and to the Right for 27" or 27-1/2" material.

1. Position the Center Tooling (Figure 16)
 - A. Pull and rotate the Retractable Plunger on each Upper and Lower Center Tooling Shaft.
 - B. Slide each pair of Upper and Lower a small distance to the Left for 24" material and to the Right for 27" or 27-1/2" material.
 - C. Rotate each Retractable Plunger and allow them to retract back onto the Roller Shaft.
 - D. Continue sliding the Roller pairs until the Retractable Plungers snap back into the shaft groove.
2. Position the Right Side Tooling (Figure 16):
 - A. Insert a 3/16" T-Handle Allen Wrench through the Access Holes and into the Screws "B" on the Entry and Exit Carriage Blocks of the first carriage. Rotate the Allen Wrench counter-clockwise to loosen the Screws "B".
 - B. Slide the first carriage inboard (to the left) for 24" material and outboard (to the right) for 27" or 27-1/2" material until it contacts the two Inside or Outside Stop Collars.
 - C. Retighten Screws "B".
 - D. Repeat steps one through four for the second carriage.

CHAPTER 9
WIDTH CHANGE PROCEDURE

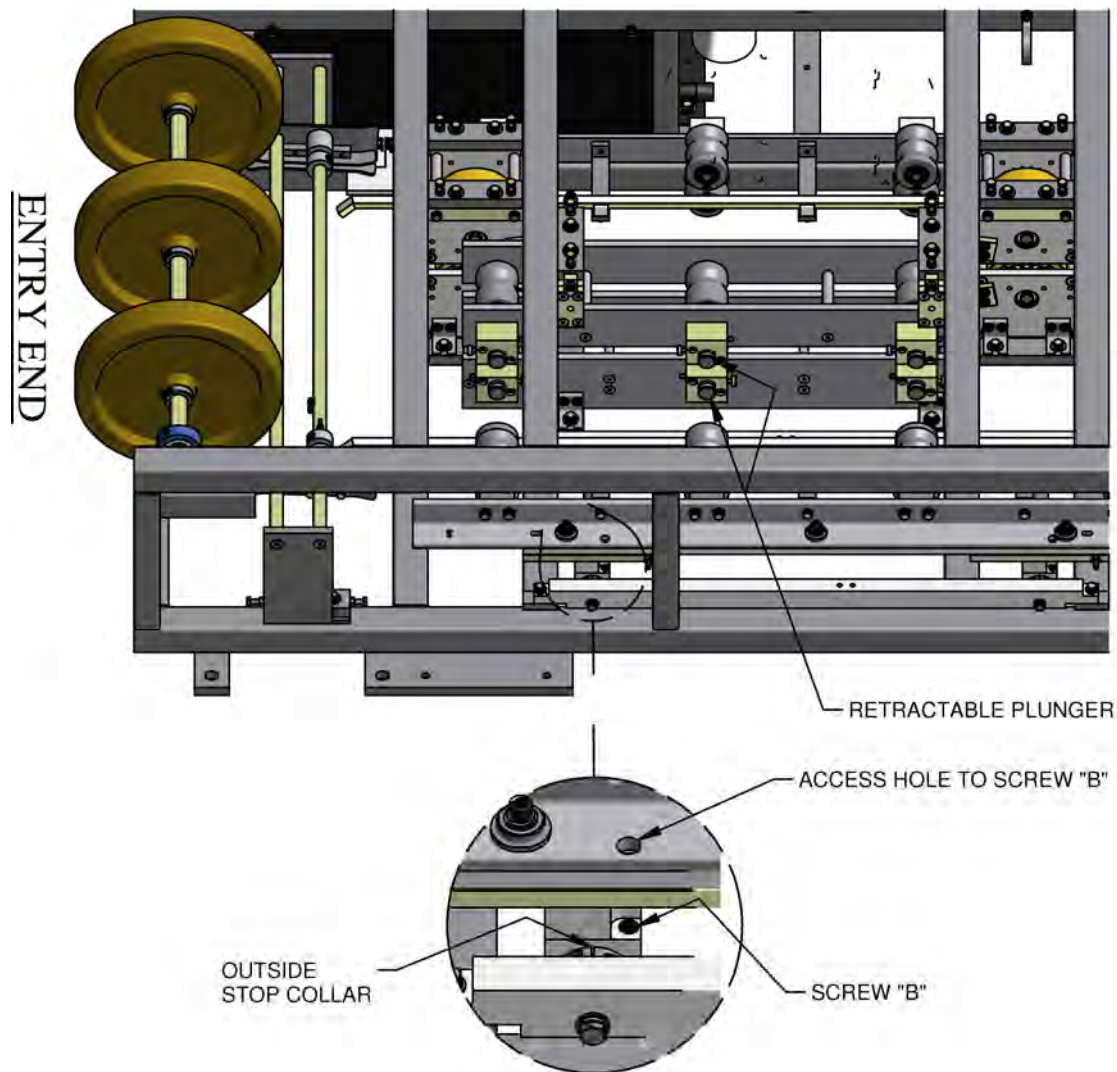


Figure 16: Width Change Fasteners

Entry Guide Adjustment

(Figure 18 & Figure 17)

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. The Left Entry Guide is set to the Tooling Rail Marker Plate mounted to the L1 Tooling Rail.
2. To align, loosen the "A" Screw on the Left Entry Guide. Slide the entry guide to the left or right until the outside edge of the entry guide is directly over one of the notches on the Tooling Rail Marker Plate. Make sure to choose the notch that corresponds to the desired width as noted on the top of the marker plate.
3. Tighten the "A" Screw on the Left Entry Guide.
4. Cut a 12" long piece of material from the coil to be used.

CHAPTER 9
WIDTH CHANGE PROCEDURE

5. Loosen "A" screw on the Right Entry Guide.
6. Slide material between the Left and Right Entry Guides.
7. Slide the Right Entry Guide to the left or right to accept the new coil width. Make sure that the coil is captured snugly between the entry guides and re-tighten the "A" screw on the Right Entry Guide.

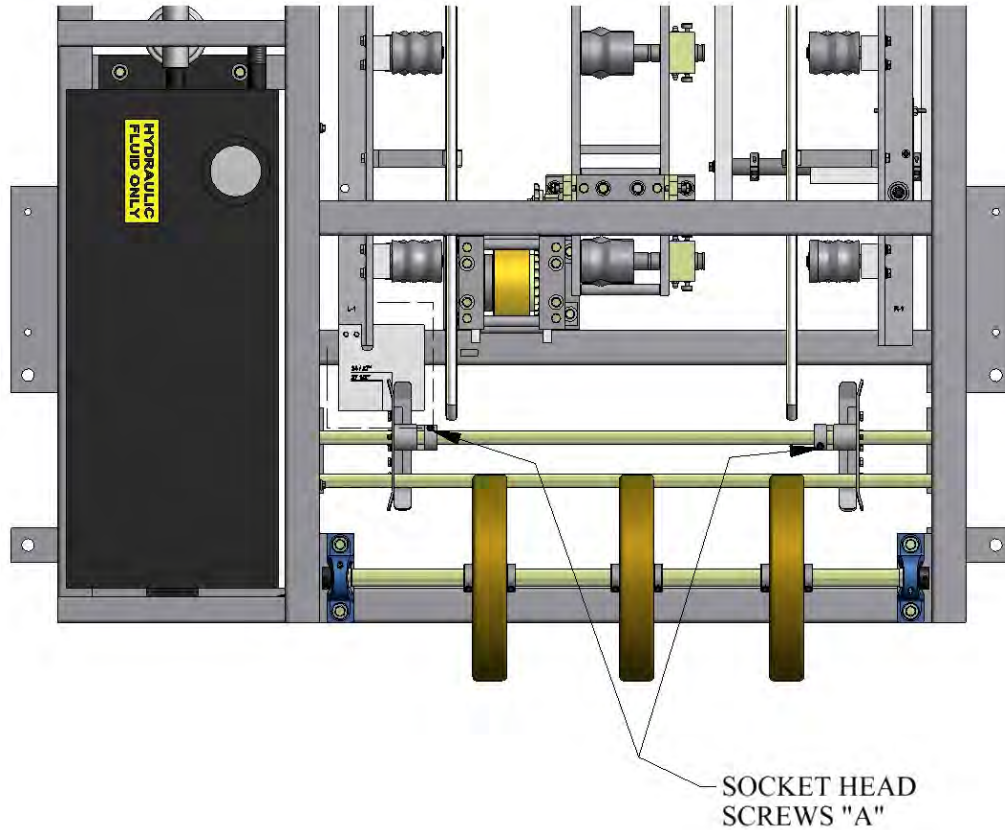


Figure 17: Entry Guide Adjustment

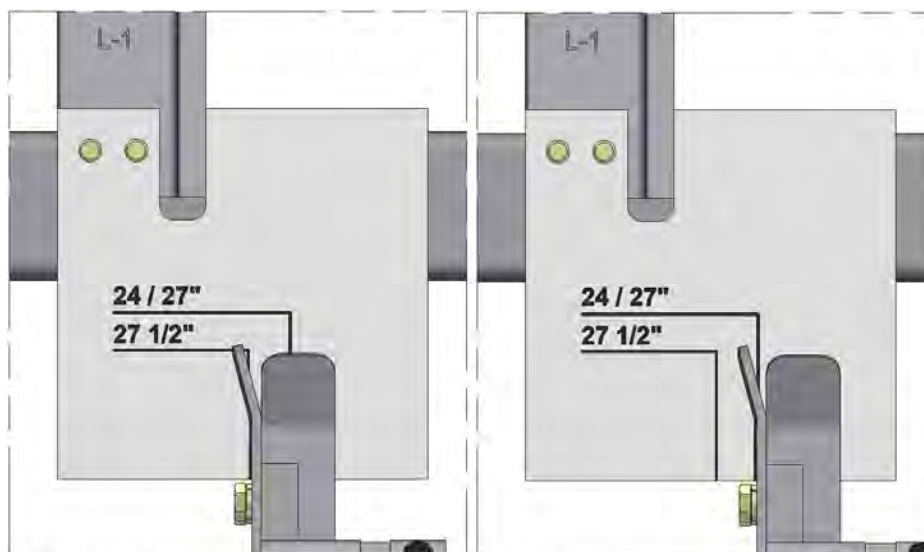


Figure 18: Entry Guide Positions

CHAPTER 9
WIDTH CHANGE PROCEDURE

Entry Drum Adjustment

(Figure 19)

The Entry Drum Assembly is necessary when feeding coil off of the optional DR1/ Dual Overhead Reel Stand. The Entry Drums need to be adjusted when a width change is made after the entry guide has been adjusted in order to line up correctly with the entry guides.

To adjust the entry drums:

1. Using a 3/16" allen wrench, loosen the six Shaft Collars "E", on either side of the drums.
2. Slide the Right and Left Entry Drums over until they are lined up with edge of entry guides. Align the Center Entry Drum so that it is centered between the Left and Right Entry Drums.
3. Slide the six Shaft Collars "E" against the sides of the drums and lock them into place.

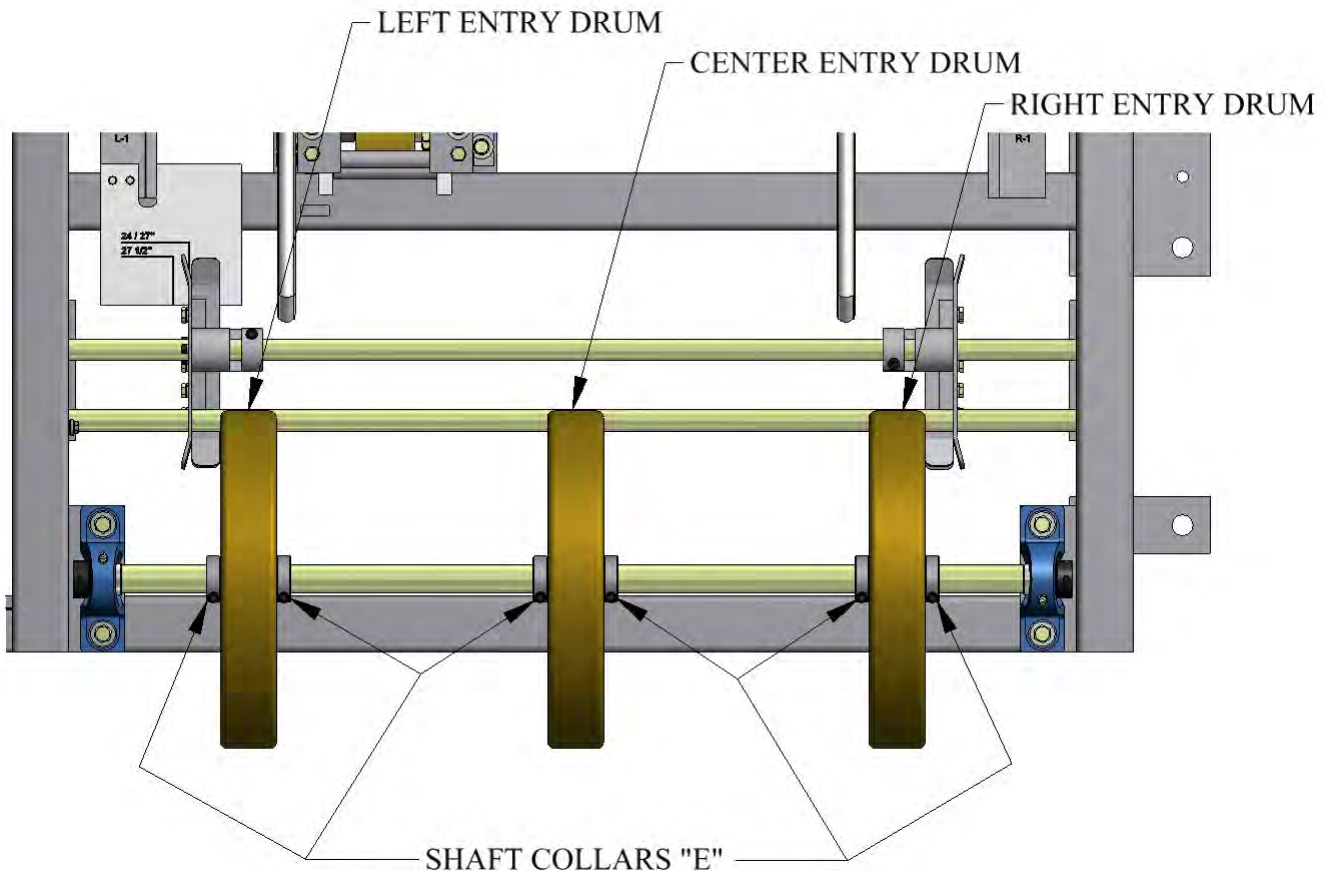


Figure 19: Entry Drum

Shear Adjustment

(Figure 20 & Figure 21)

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.

CHAPTER 9
WIDTH CHANGE PROCEDURE

Caution: Pressing the Emergency Stop button will stop the shear WITHOUT sending the shear up.

The shear is electrically activated and hydraulically driven.

The two Top Limit Switches and single Bottom Pressure 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 Pressure Switch sends the shear back up once the set pressure is reached.

CHAPTER 9
WIDTH CHANGE PROCEDURE

SHEAR ADJUSTMENTS

Bottom Shear Dies (Figure 21 - Detail A)

1. Bottom dies should be adjusted 1/32" below the bottom edge 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".

ADJUSTING THE ENTRY AND EXIT SHEAR DIES

1. The Entry and Exit Shear Dies must be adjusted to the proper location over the panel. This is done by centering the dies under the panel. The Exit Dies should be slightly down from the Entry Dies so that after a cut is made, the panel does not hang up on the Exit Dies. This is designed into the parts and no up and down adjustment should be needed.
2. Each Shear Die Holder is held in position by (2) "C" bolts passing through slotted holes at the bottom edge of the holder, and threaded into the Entry and Exit Shear Plates.
3. Visually sight thru the male and female entry dies. Rough align them to the forming tool "line of fire" by moving them side-to-side. If necessary, remove bolts "C" and slide the Die Holders left or right until two mounting holes are seen that will work for proper alignment, then re-install bolts "C". **Tighten them just enough to hold the dies in position.**
4. Jog the material through the machine and stop about 2 inches from the Entry Shear Dies. Now re-sight the alignment of the Male and Female Dies to the actual legs of the panel and move them accordingly to assure the panel will pass through without hanging up. Carefully jog material through the shear dies and verify alignment by pressing down on the panel over each shear die.
5. Once alignment of the dies is achieved, Jog the material in reverse and tighten all "C" bolts. Jog the material out approximately 2". Engage the shear to cut to 2" piece off. Inspect the cut made on this piece and the piece still in the machine by jogging it out another 2" so it can be viewed. If the cut is not satisfactory, re-adjust as necessary.

CHAPTER 9
WIDTH CHANGE PROCEDURE

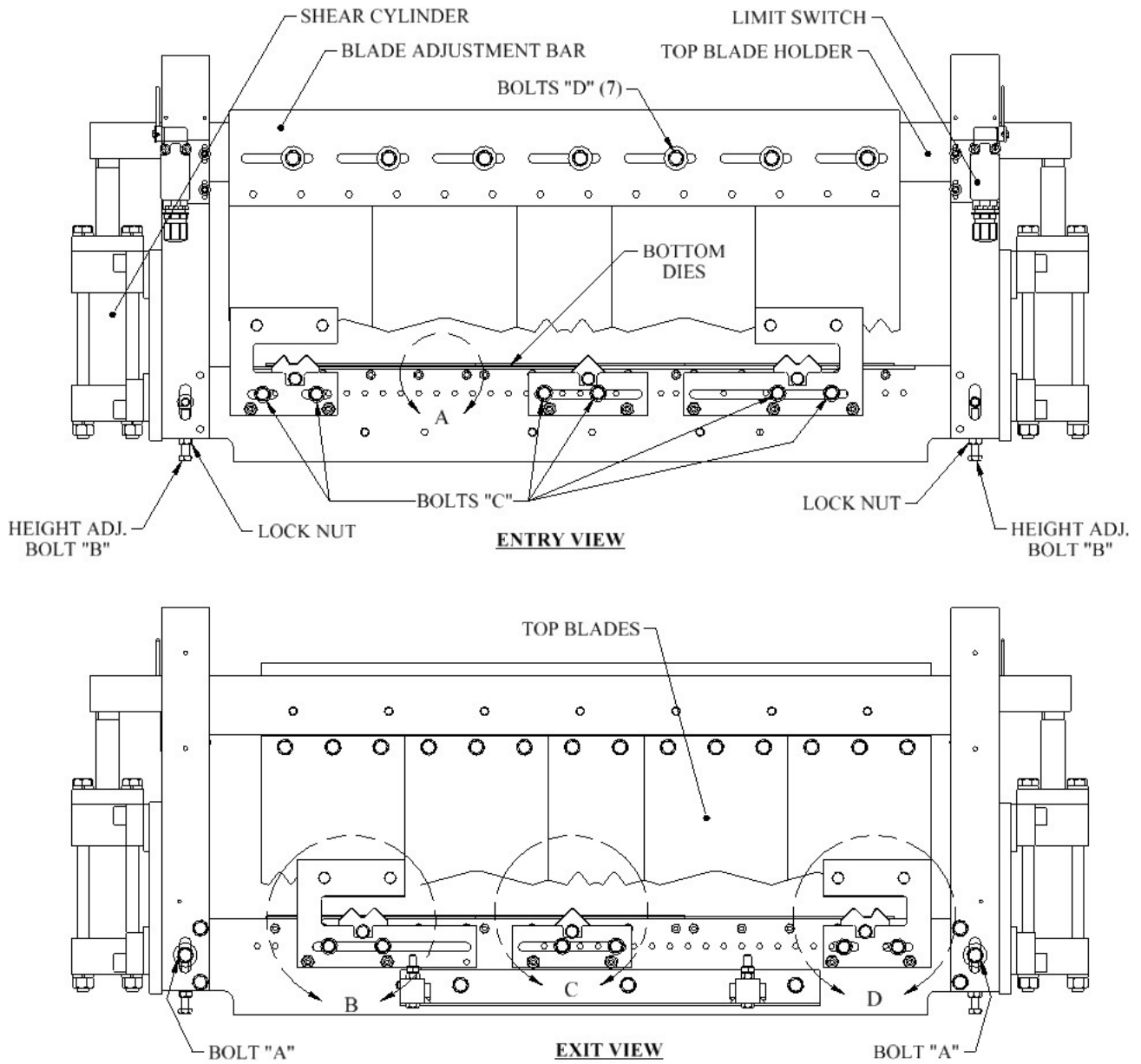


Figure 20: Shear Assembly

CHAPTER 9
WIDTH CHANGE PROCEDURE

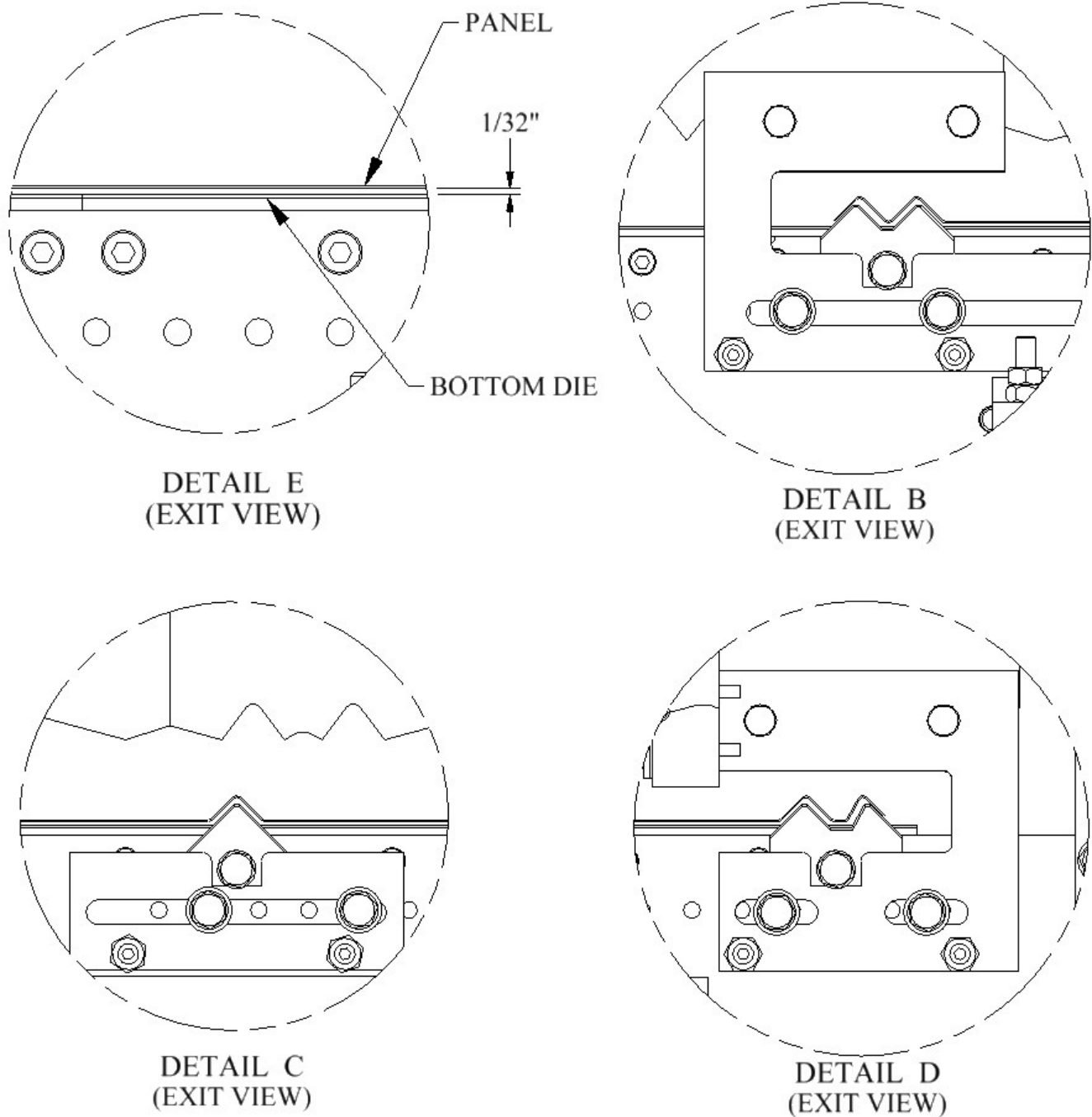


Figure 21: Shear Assembly Details

Arbor Adjustment

(Figure 9)

The coil must be positioned properly on the arbor for the material to enter the machine easily. The position of the coil on the arbor is different for 24", 27" and 27 1/2" material.

CHAPTER 9
WIDTH CHANGE PROCEDURE

Using the Reel Set Up Chart, (Figure 9), find the “D” dimension that corresponds to the profile being used. Slide the material on 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.

Loading Machine with Material

1. Cut a 1” triangle off of the 2 leading corners of the coil and feed it into the entry guides as shown below.

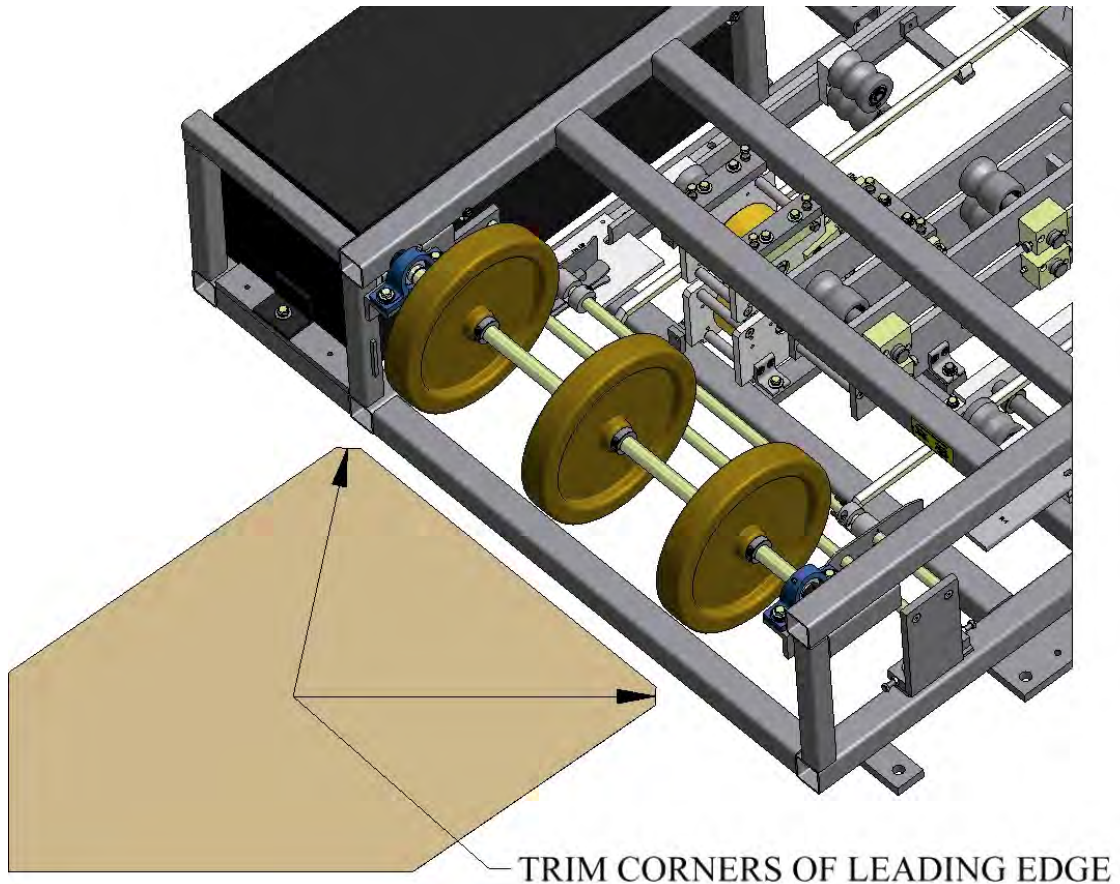


Figure 22: Feeding Material into Entry Guides

2. Start the machine and use the Jog button on the Manual Control Box or Computer, 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 Shear Assembly

SHUT THE MACHINE DOWN BEFORE PROCEEDING.

Visually sight through the shear assembly to ensure that the material is in line with the shear dies. If the shear dies need to be adjusted left or right, see

CHAPTER 9

WIDTH CHANGE PROCEDURE

3. SHEAR ADJUSTMENTS section on page 31.
4. After the shear is adjusted in line with the material, start the machine and carefully jog the material through the shear assembly. Press the Shear Down button to cut off the leading edge of material and the machine is now ready to run panels.

CHAPTER 10
MACHINE ADJUSTMENT

MACHINE ADJUSTMENT

The L8, R8 and corresponding center roller assembly are set from the factory with a clearance of .035” and shouldn’t need to be adjusted. The last stations in the machine, L9, R9 and corresponding center roller assembly can be adjusted to change uphill and downhill.

Unlike most panel machines, the 5VC machine should be adjusted so that the panel runs slightly downhill. When the panel is laid flat on a surface it will flatten out and any oil canning should disappear. If the panel is run out from the machine with no downhill and laid on a flat surface, the edges of the panel will lift up away from the surface.

ADJUSTMENT PROCEDURE

(Figure 23)

The following adjustments are sensitive. Only make adjustments in small increments then run a test panel and readjust as necessary.

To adjust the upper rollers on the L9 and R9 stations:

1. Loosen the 5/16 Set Screw “A”.
2. Insert a punch or allen wrench into the hole on the Eccentric Roller Shaft and rotate the shaft.
 To increase downhill, rotate the shaft towards the shear.
 To decrease downhill, rotate the shaft away from the shear.
3. While holding the Eccentric Roller Shaft in the desired position, tighten Set Screw “A”.

To adjust the last station on the Center Roller Assembly:

1. Loosen the 5/16 Set Screw “B”.
2. Insert a punch or allen wrench into the hole on the Eccentric Roller Shaft and rotate the shaft.
 To increase downhill, rotate the shaft towards the shear.
 To decrease downhill, rotate the shaft away from the shear.
3. While holding the Eccentric Roller Shaft in the desired position, tighten Set Screw “B”.

CHAPTER 10
MACHINE ADJUSTMENT

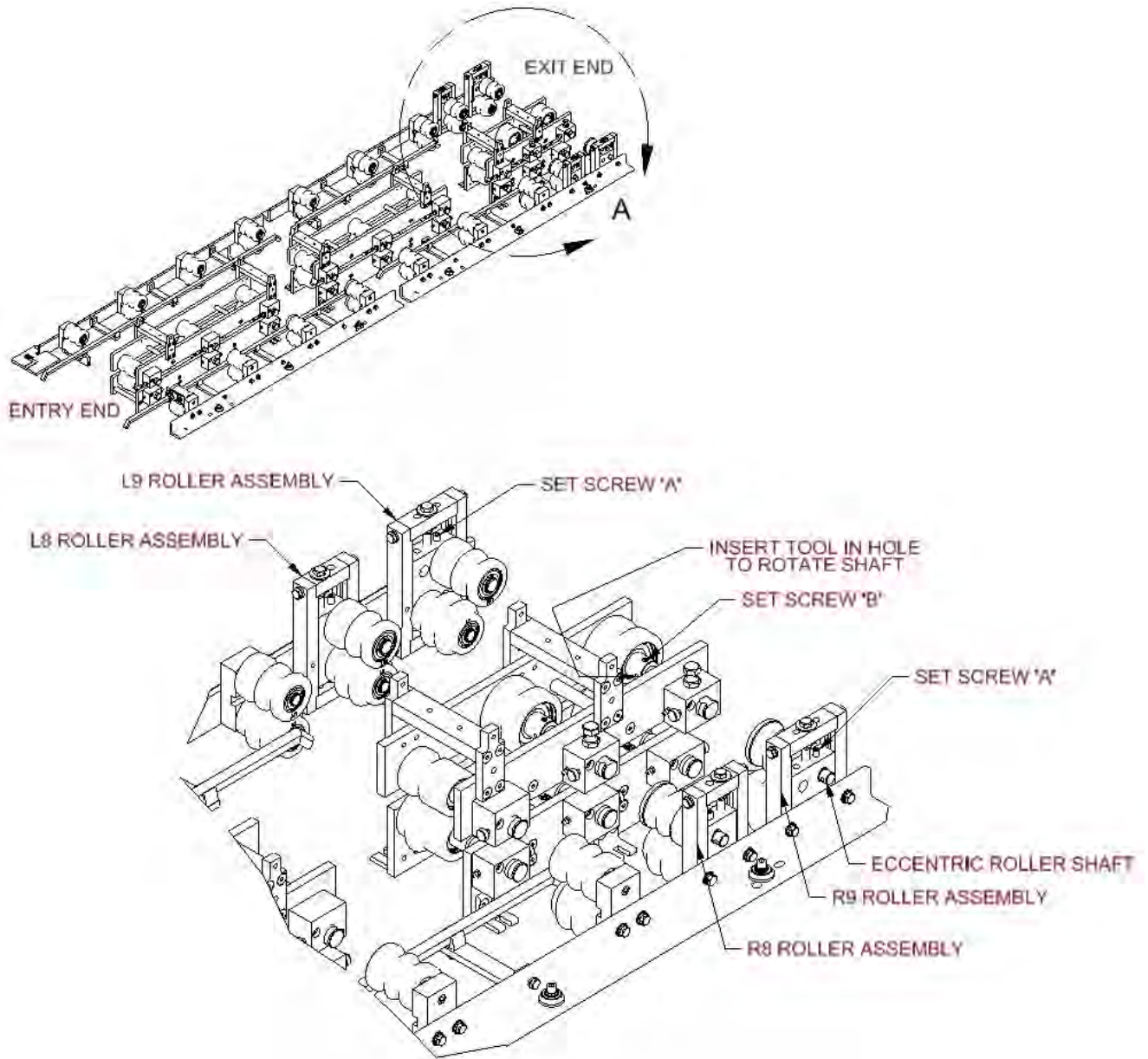


Figure 23: Downhill Adjustment

CHAPTER 10
MACHINE ADJUSTMENT













CUSTOMER NAME: _____	SERIAL NO: _____
SALES ORDER #: _____	COMPUTER S/N: _____
CIRCLE ONE: QCPP-E-1 QCPP-E-3 QCPP-E-4 QCPP-E-5 QCPP-E-6	
24"	27 1/2"
ENTRY GUIDE R _____ L _____	R _____ L _____
LEFT RAIL _____	_____
RIGHT RAIL _____	_____
1 & 2 _____	_____
SHEAR R _____	L _____
L-8 ECCENTRIC →  _____	L-8 ECCENTRIC →  _____
_____  ← L-9 ECCENTRIC	_____  ← L-9 ECCENTRIC
R-8 ECCENTRIC →  _____	R-8 ECCENTRIC →  _____
_____  ← R-9 ECCENTRIC	_____  ← R-9 ECCENTRIC
C-8 ECCENTRIC →  _____	C-8 ECCENTRIC →  _____
_____  ← C-9 ECCENTRIC	_____  ← C-9 ECCENTRIC
TOP CENTER TO BOTTOM ROLLER GAPS _____	
NOTES: _____	

Figure 24: 5VC Setup Sheet

CHAPTER 10
MACHINE ADJUSTMENT

ROLLER SYSTEM AND PANEL PROFILE DRAWINGS

ROLLER SYSTEM AND PANEL PROFILE DRAWINGS

L-LEFT T-TOP
R-RIGHT B-BOTTOM

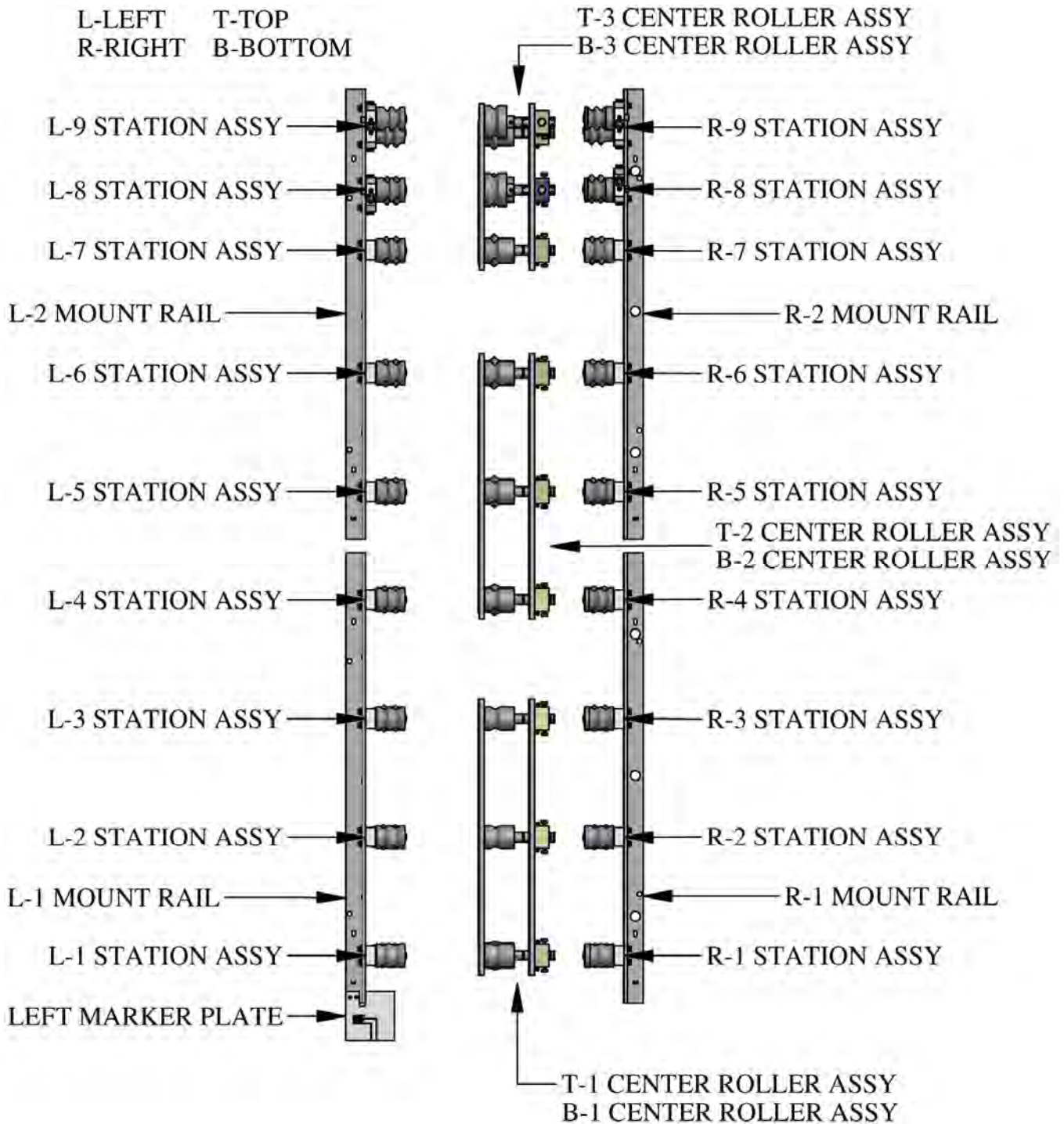


Figure 25: 5VC Roller System

ROLLER SYSTEM AND PANEL PROFILE DRAWINGS

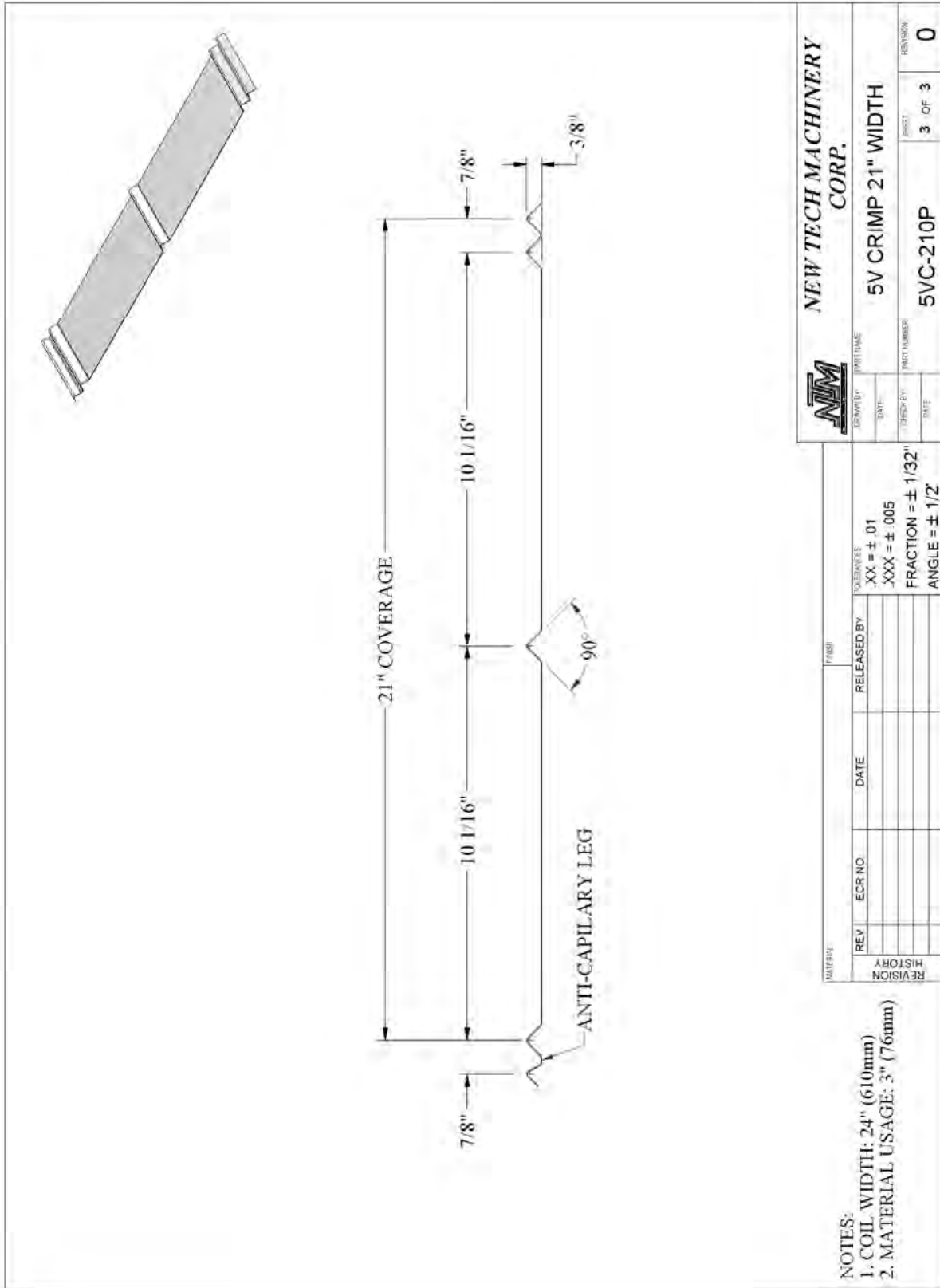


Figure 26: 5VC 21" Width

ROLLER SYSTEM AND PANEL PROFILE DRAWINGS

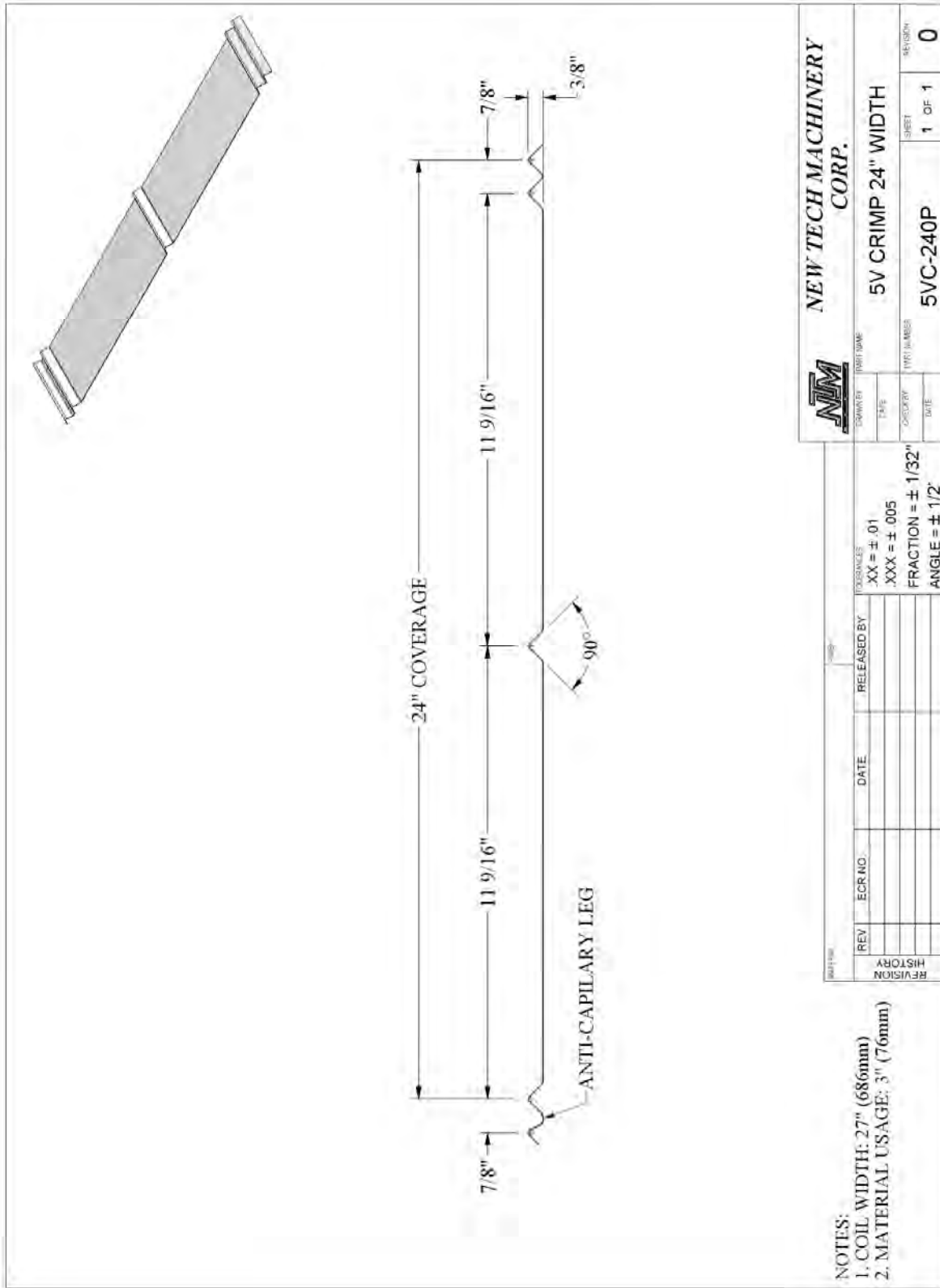


Figure 27: 5VC 24" Width

ROLLER SYSTEM AND PANEL PROFILE DRAWINGS

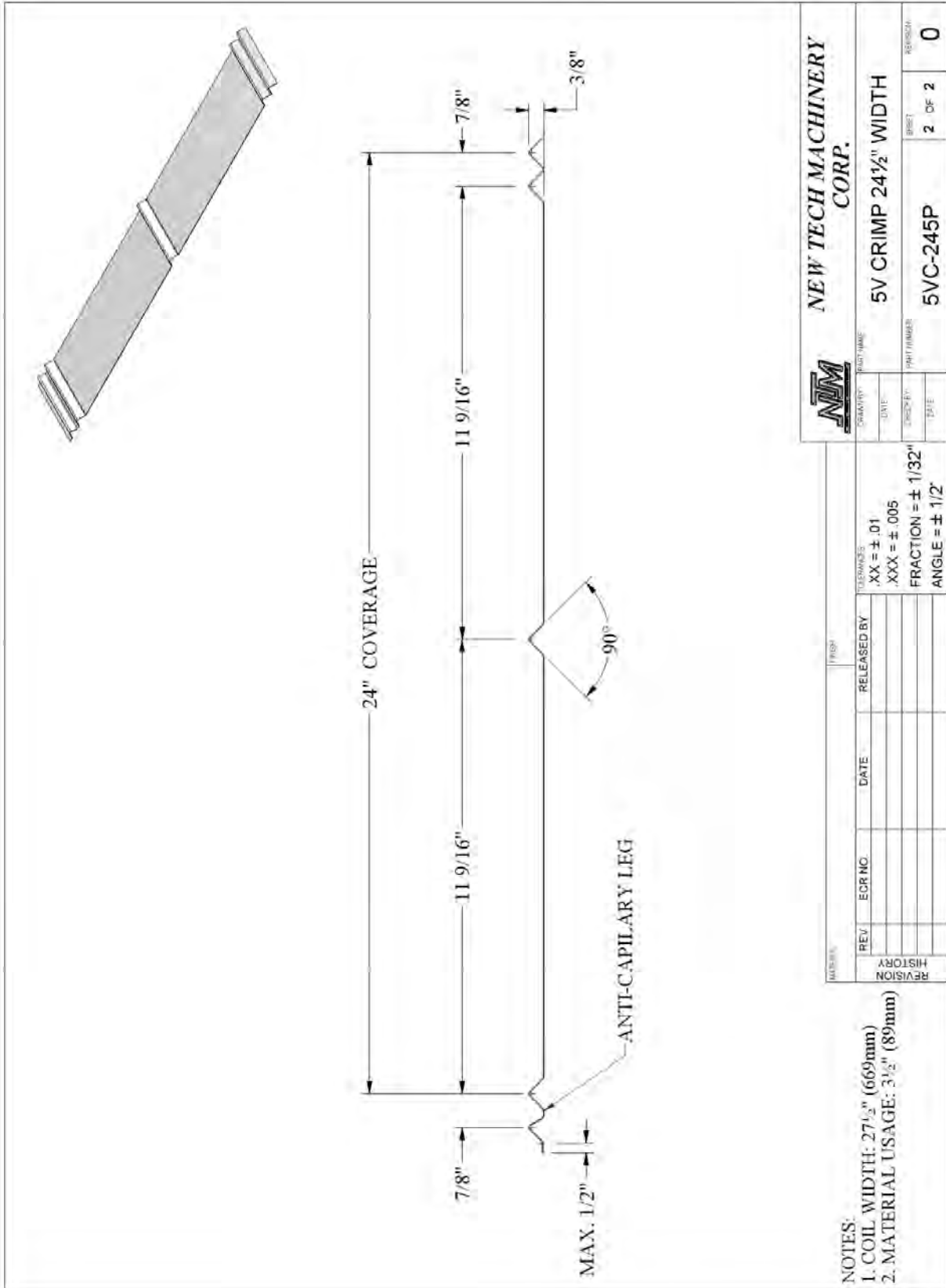


Figure 28: 5VC 24 1/2" Width

CHAPTER 11
RUN OUT TABLE AND REMOTE LIMIT SWITCH

RUN OUT TABLES AND REMOTE LIMIT SWITCH

The Run-Out Table attaches to the Exit End of the Shear assembly and are used to support the panel as it exits the machine. The Run-Out Tables are 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 6) is designed to be used with the run out tables for controlling panel length.

RUN-OUT TABLE SETUP

(Figure 29 & Figure 30)

1. Place 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 the Mounting Holes “B” over the (2) Mounting Lugs “A” 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.
5. Repeat the above procedures for each succeeding table and attach it to the bracket on the end of the previous table.

CHAPTER 11
RUN OUT TABLE AND REMOTE LIMIT SWITCH

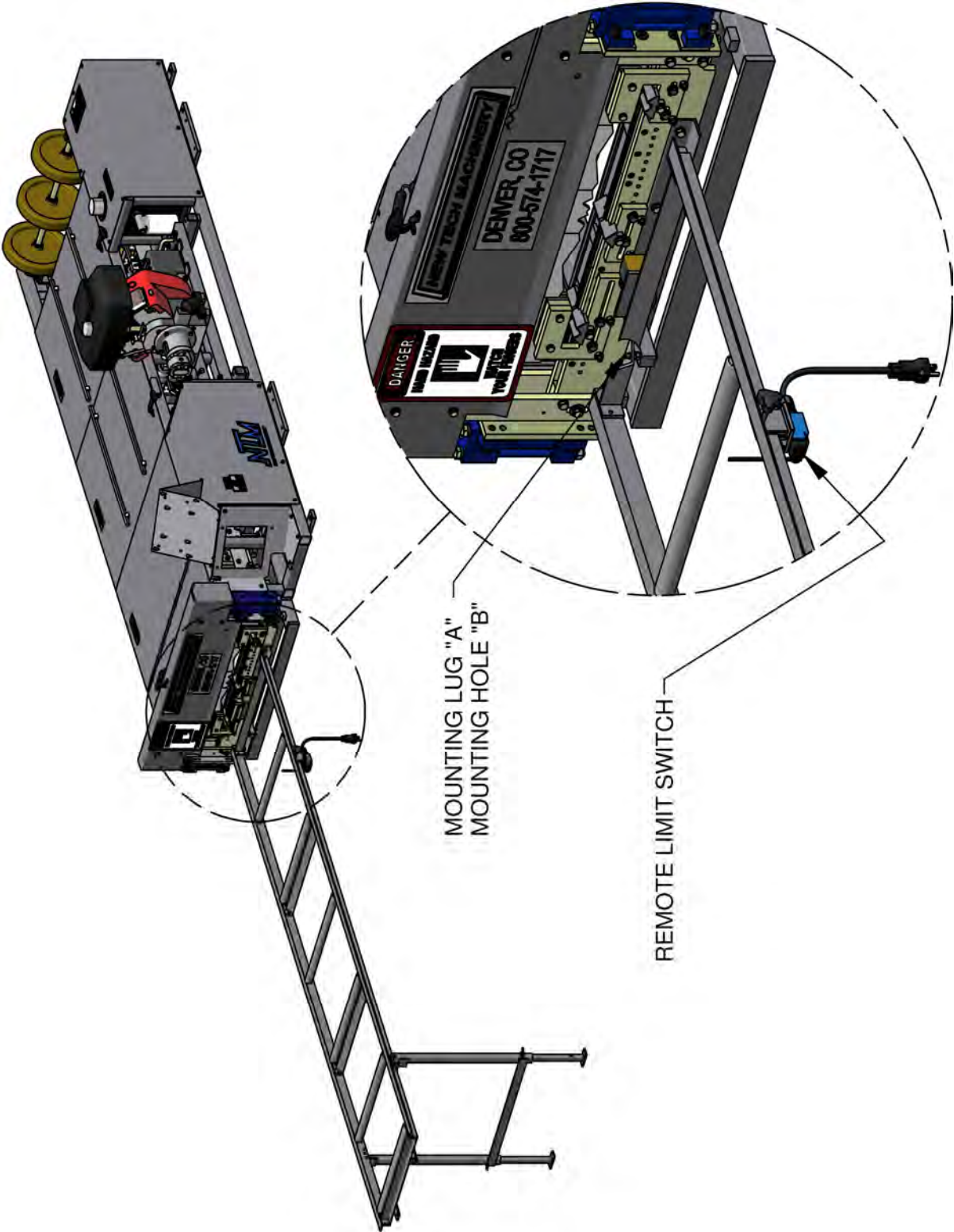


Figure 29: Run Out Table

CHAPTER 11
RUN OUT TABLE AND REMOTE LIMIT SWITCH

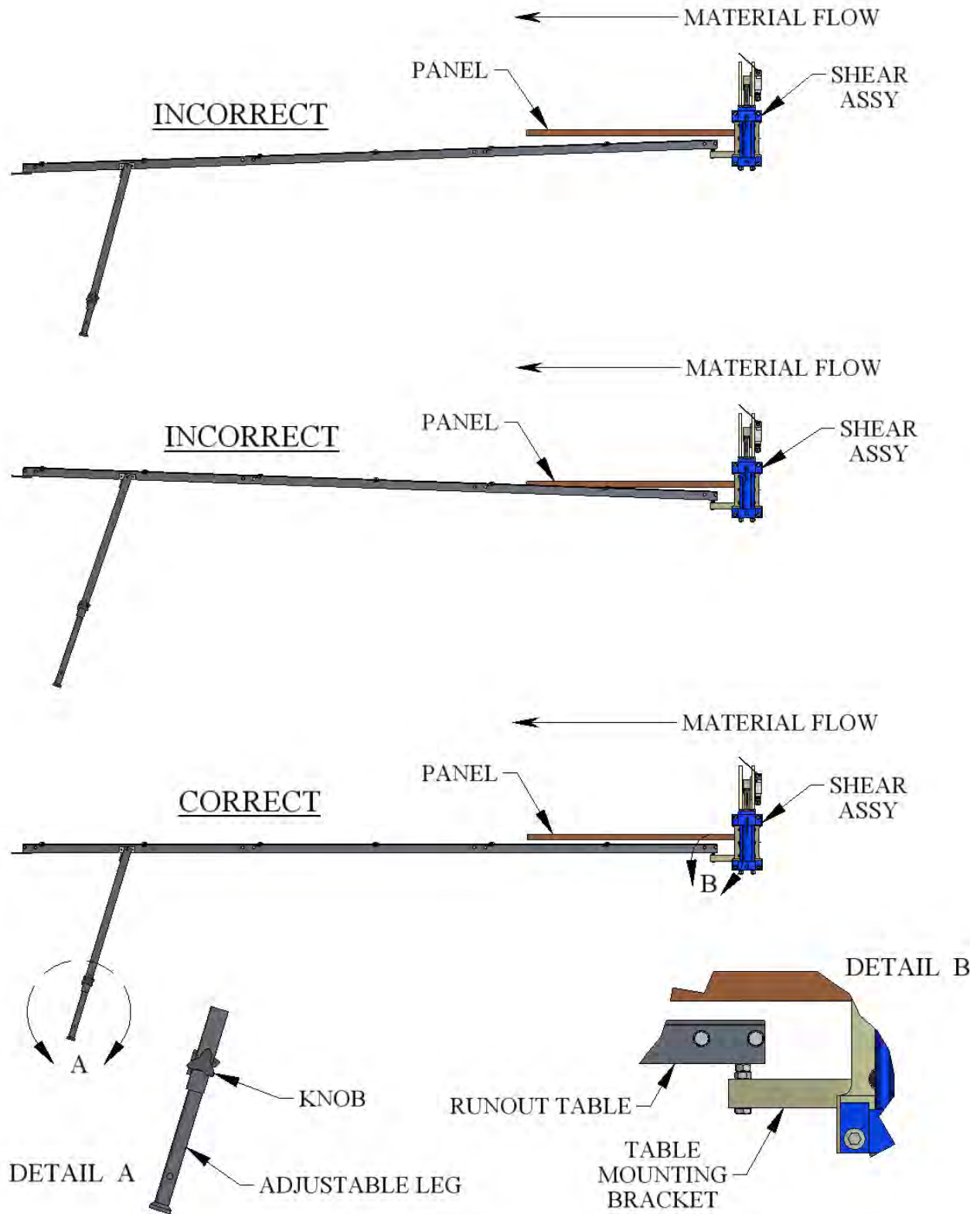


Figure 30: Run Out Table Setup

CHAPTER 12
QUICK CHANGE POWER PAC

QUICK CHANGE POWER PAC

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

POWER PAC REMOVAL

(Figure 31)

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. Remove Bolts "B" and uncouple the hydraulic pump from the motor-pump adapter. Remove the coupling insert found inside the motor-pump adapter and set aside.
4. Using a 9/16" wrench, remove the two "A" bolts.
5. Using the two handles, lift the Quick Change Power Pac out of the machine.

Install new Power Pac in reverse order.

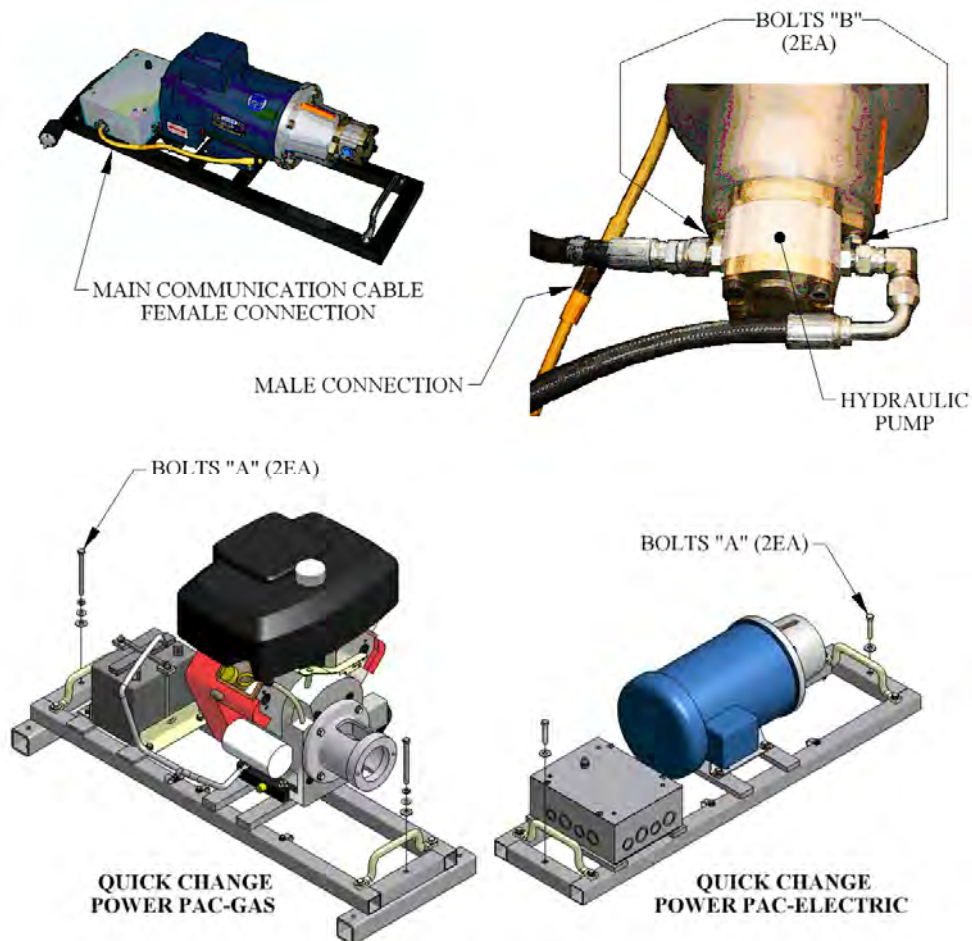


Figure 31: Quick Change Power Pac

CHAPTER 13
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 continues laboring and pushing the Red Shear Up Button does not return it to the top of stroke.

SOLUTION: Adjust the pressure switch (Figure 32) by turning the silver knurled sleeve "A" counterclockwise until the shear goes up. **NOTE:** If the sleeve is turned too far CCW, problem #2, below, will be seen on the next cut made.

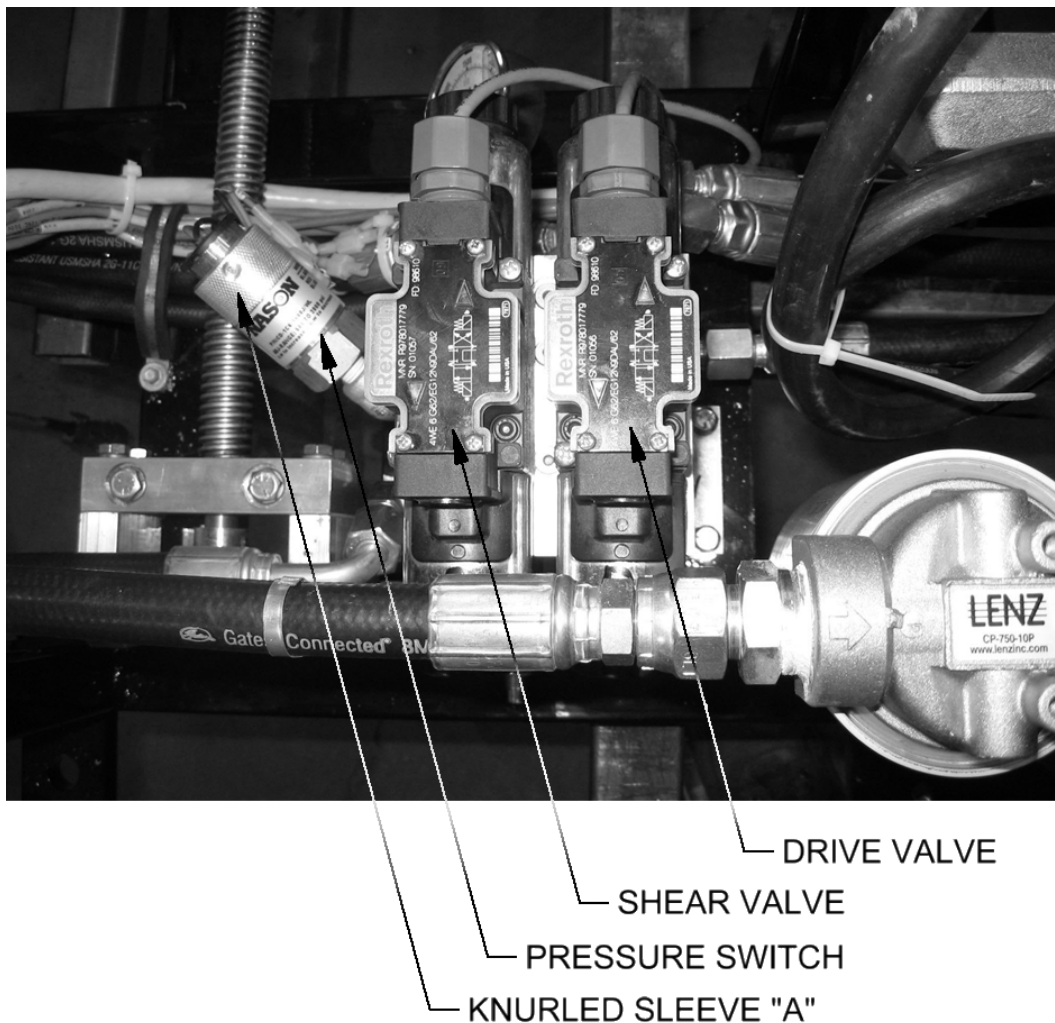


Figure 32: Pressure Switch Adjustment

CHAPTER 13
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: 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 32) 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 seen on the next cut made.

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

SOLUTION: Remove the Shear Cover. Lift the arms "A" on the limit switches (Figure 34) 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:** Tape one or both Limit Switch Arms "A" to the Top Shear Bar "B". Loosen Hex Nut "C" until spring tension is released. Using a small flat tipped screwdriver, turn Slotted Stud "D" toward the entry end of the machine until a click is heard and stop. Repeat this process a few times so that the adjustment can be stopped right when the click occurs. While holding this position, tighten Hex Nut "C" to lock in adjustment. 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 produced.

CHAPTER 13
TROUBLESHOOTING

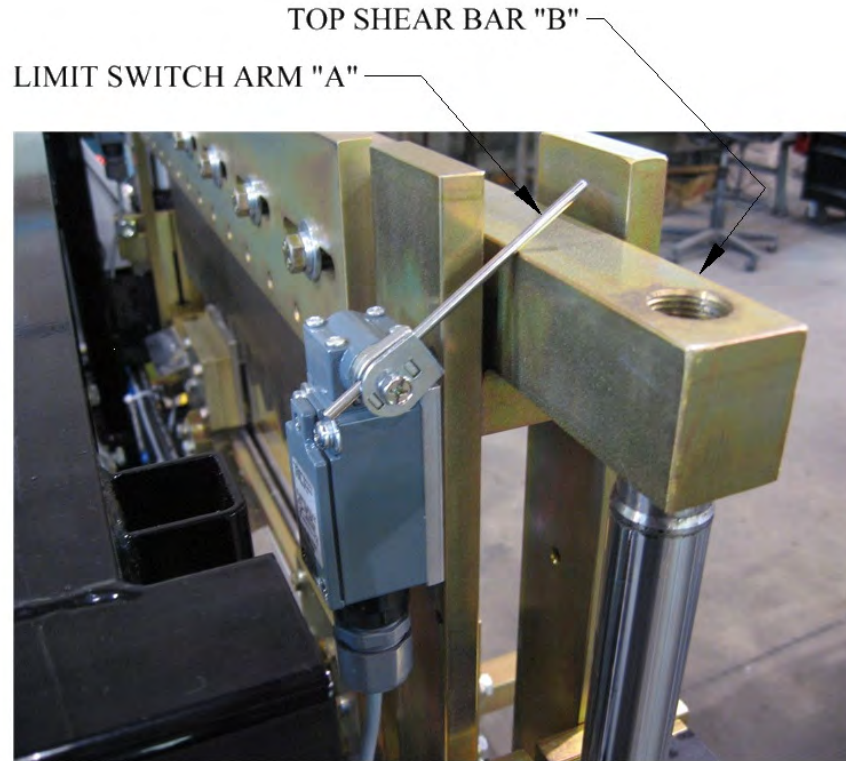


Figure 33: Top of Stroke Limit Switch

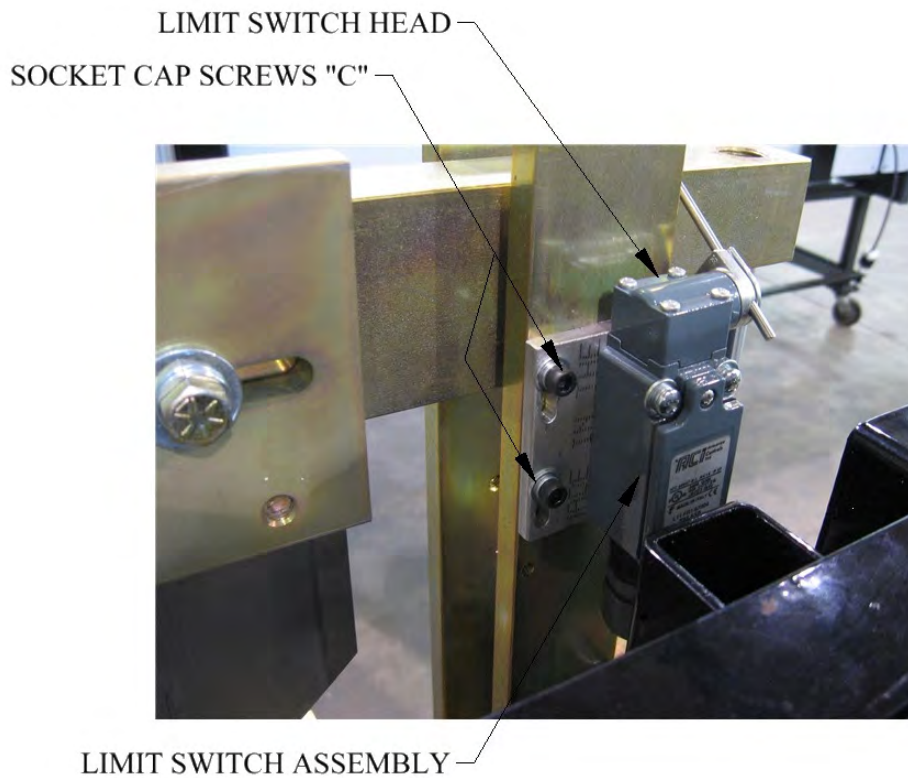


Figure 34: Limit Switch Adjustment

CHAPTER 13
TROUBLESHOOTING

4. Manual Control Panel buttons do not work.

SOLUTION #1: Check fuse inside of Manual Control Box. Replace if blown with a 10-amp time delay fuse (Figure 7 on page 13).

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

APPENDIX A
COMPUTER BATCH AND LENGTH CONTROLLER

COMPUTER BATCH AND LENGTH CONTROLLER

The optional Batch and Length Control Computer is used to control number and length of panels that your machine produces. It uses an Encoder and Wheel assembly that runs on the bottom of the panel for measurement. The Encoder assembly is located between the 4th and 5th bottom Drive Rollers of the machine and the Encoder Cable exits thru the end cover under the Manual Control Panel assembly.

Batch and Length Controller Connection (Figure 35 & Figure 36)

1. Connect the Main Control Cable (larger connector) to the panel mounted male connector "A" 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. Turn clockwise until snug. Caution: **DO NOT rotate the cable clamp on the back of the plug to tighten this connection. You must turn the threaded ring of the plug only, or damage will occur.**
2. Connect the Encoder Cable (smaller cable) to the panel mounted Female connector "B" located in the bottom of the computer on the left side. Again, make sure that the key and slot are aligned and carefully start the threads on the connection. Turn clockwise until snug and **DO NOT rotate the cable clamp on the back of the plug to tighten this connection. You must turn the threaded ring of the plug only, or damage will occur.**
3. Refer to instructions that follow for computer operation.



Figure 35: AMS Box Without Cables

APPENDIX A
COMPUTER BATCH AND LENGTH CONTROLLER



Figure 36: AMS Box With Cables

Introduction

Overview

The AMS Controls MP465 is an industrial controller used to control cut-to-length machinery. Figure 37 shows the front panel of MP465.

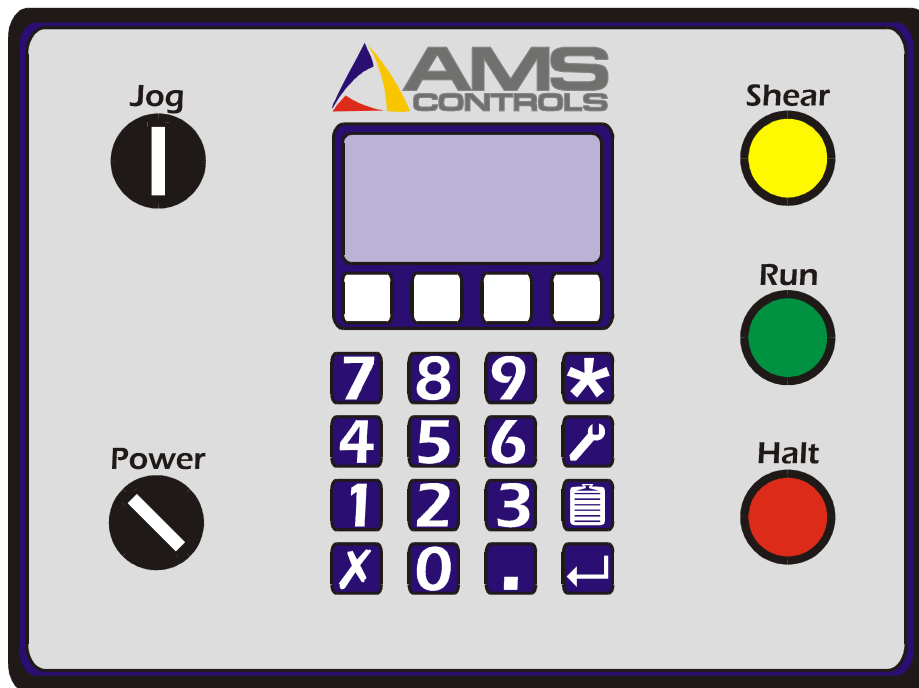


Figure 37: AMS Controls MP465 Controller

APPENDIX A
COMPUTER BATCH AND LENGTH CONTROLLER



Features

The MP465 controller's features include:


- Accurate length control
- Simple programming
- Easy calibration


Manual Operations

Jogging Material

- To jog material forward using the MP465, turn the jog switch  on the controller to the right (clockwise).
- To jog material in reverse using the MP465, turn the jog switch  on the controller to the left (counter-clockwise).

Manual Shear

To fire the shear manually, press the shear button .






 **Note:** The controller must be in Manual mode.

Production Procedures

Screen Navigation




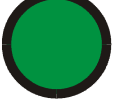


Keypad


The keypad uses hot keys to enable quick entry into certain screens.

	Program	Press [Program] to program a Job Number, Quantity, and Length; press it again to specify the next job to run.
	Status	Press [Status] to exit the current screen and return to the Status screen.
	Calibration	Press [Calibration] to calibrate the length management system; by pressing it again you can display other screens like the Production Totalizer and Stopping Reaction.
	Enter	Press [Enter] to enter or store the current value. [Enter] can also be used to move to the next value.
	Clear	Press [Clear] (<i>clear entry</i>) to clear or set an entry back to its original value.

APPENDIX A
COMPUTER BATCH AND LENGTH CONTROLLER


Push Button and Front Panel Selector Switches


Shear 	Shear	Press [Shear] to manually activate the shear.  Note: The MP465 controller allows this switch to operate when the machine is stopped.
Halt 	Halt	Select [Halt] to load a coil and to stop the machine
Run 	Run	Select [Run] to start the machine after a job has been programmed
Jog 	Jog (Forward and Reverse)	When the machine is in manual mode (i.e., the Run button is not lit), turn and hold the Jog switch clockwise to jog the material forward, turn and hold the Jog switch counter-clockwise to jog the material in reverse. This switch is inactive when the Run switch is lit.
Power 	Power	This switch turns the controller on and off. <ul style="list-style-type: none">• Turn the switch to the right to apply power to the controller unit• Turn the switch to the left to remove power

 **Note:** If the controller unit has been wired to by-pass this switch, the position of the switch will have no effect on the controller.

Program a Job

Jobs are composed of a quantity of a specified length. You can program up to 50 different quantities and lengths into the controller. To program a job,

1. Select [**Program**] . The current data entry field highlights; once new data has been entered, the data field starts blinking.


 **Note:** Pressing [**Clear**] while the data field is blinking re-loads the original value into the data field. Pressing [**Enter**] saves new data and highlights the next field.

2. In the **Job Number** field, enter a number to assign to this job (a value between 1 and 50).
3. In the **Quantity** field, enter the number of parts you want to create (up to 999).
4. In the **Length** field, up to 999 feet and 11.999 inches.

COMPUTER BATCH AND LENGTH CONTROLLER



5. The controller displays the message “*Pause After Job xx?*” (Where xx is the job number assigned in step 1). Select:
 - **Yes** to have the machine halt automatically after the selected job number is finished.
 - **No** to have the machine change lengths “on-the-fly” and run the job following the selected job without first stopping.

 **Note:** To restart the machine after an automatic halt, press [**Run**].


 **Note:** To increase productivity, additional jobs can be programmed while the machine is running previously programmed jobs.

Automatic Operation


The MP465 runs all programmed jobs automatically.

- To start the machine after all desired jobs have been programmed, press [**Run**] .
- To stop the machine at any time, press [**Halt**] .


The machine halts automatically when all programmed jobs are completed.

 **Note:** If the encoder is counting in the negative direction, change the encoder direction in the Setup Screen as described previously.

Length Calibration

 **Note:** Calibration is typically required only during machine commissioning or after changing coil stock.



Length calibration adjusts for errors in the size and tracking of the measuring wheel and is expressed as a percentage, with 100% being no correction. Increasing the correction factor causes the parts to become longer and decreasing the value shrinks the parts. The MP465 controller’s length calibration feature automatically computes a new correction factor by comparing the desired (Programmed) length to the actual (Measured) length. Length Calibration should be used any time part lengths are incorrect in a consistent manner (e.g., all parts 1mm too long, etc.). Length calibration will not fix a situation where parts are inconsistent (e.g., parts vary +10 to -10mm).


 **Note:** When calculating the correction factor, make several parts and use the average of these parts for the part length. The first part produced should not be used in this calculation since it may be inaccurate due to shear reaction or other variances.

To calibrate the MP465 controller,


6. The controller can be calibrated anytime the measured part length is not matching programmed part length.

APPENDIX A
COMPUTER BATCH AND LENGTH CONTROLLER

7. With the controller powered on, press [**Calibration**]  until the screen title says “CALIBRATE-1”. The display shows you the current correction factor. Press [**Clear**]  to begin the calibration process.
8. When the prompt “ENTER PROGRAM LENGTH” displays, enter the part length of the part you are attempting to produce.

 **Note:** The longer the part is that you attempt to calibrate on, the more accurate the calibration will be.

9. When the prompt “ENTER MEASURED LENGTH” displays, enter the part length of the part you actually measured. Using an average of several measured parts will provide the most accurate result.
10. The screen title will change to “CALIBRATE-4 and show the OLD and NEW correction factors. The controller is now calibrated.

 **Note:** If the computed correction factor is greater than 110% or less than 90%, the “Calibration Out of Range” error message displays and the calibrate cycle is ignored.

Clear Controller Memory

A quick way to clear out all of the Jobs from the controller is to clear its memory. All of the controllers other internal settings like correction factor and stopping reaction time will be preserved.

To reset the memory on the controller,


11. Turn the device off, and then back on.
12. Press [**5**] while the startup screen is showing.

 **Caution:** Clearing the controller memory clears out *all* jobs that are programmed into your controller!




Administrative Screens and Functions

Calibration


Length calibration is accomplished using an internal parameter called correction factor. The correction factor is used compensate for wear and manufacturing tolerances in the encoder wheel and variations in material surfaces.




The calibration can be viewed in two screens. Press and release the [**Calibration**]  key until the screen title displays “CALIBRATE-1” or “CALIBRATE-7”.

COMPUTER BATCH AND LENGTH CONTROLLER

 **Note:** To reset the correction factor to 100% press [Clear] . When the prompt “ENTER CODE TO CLEAR TOTAL” displays; enter 1984 and press [Enter] .


Production Totalizer


Total production of the machine is counted by the controller. You can view the production counter by pressing and releasing the [Calibration]  key until the screen title displays “PRODUCTION-1”.

 **Note:** To reset the totalizer to zero press [Clear] . When the prompt “ENTER CODE TO CLEAR TOTAL” displays; enter 1984 and press [Enter] .

Reaction Time

Stopping Reaction is an internal parameter that the controller calculates over the span of several parts. It is used to compensate for the time it actually takes for the machine to stop after the controller tells it to.

The stopping reaction can be viewed by pressing and releasing the [Calibration]  key until the screen title displays “REACTION-1” will allow you to display the controllers stopping reaction time value.

Note: To reset the reaction time to zero press [Clear] . When the prompt “ENTER CODE TO CLEAR REACTION” displays;

Troubleshooting

- 1. When running machine with the Batch and Length Control Computer: The drive will not start the next panel programmed after cutting the first panel of a job. (If machine is equipped with a Photo Eye, see Error! Reference source not found.)**

SOLUTION #1: The Photo Eye lens is dirty. Clean debris from lens.

SOLUTION #2: The Photo Eye is aimed toward the shear. Loosen mounting bolts and aim lens away from shear.

- 2. Batch and Length Control Computer shows erratic behavior.**

SOLUTION #1: Check battery condition. System requires 12 volts to operate correctly. Charge or replace battery as required.

SOLUTION #2: Check condition of Main Communication Cable. Tighten cable connection or replace cable as required.

COMPUTER BATCH AND LENGTH CONTROLLER

SOLUTION #3: Clear memory on computer. Turn power off at computer. Turn power back on and push the #5 button while the boot screen is on.

CAUTION: CLEARING THE MEMORY WILL CLEAR ANY JOBS PREVIOUSLY PROGRAMMED.

3. Computer runs by programmed length and does not stop.

SOLUTION #1: Check Encoder direction on set up screen. It should read counterclockwise. Turn power off on computer. Turn power back on and press the #9 button while the boot screen is on. If direction is set to CCW press the enter button. To change from CW, use arrow button to scroll down until direction is highlighted. Press any numbered key to toggle between CW and CCW. Set to CCW and press the enter button. Press program button (clipboard) and continue.

SOLUTION #2: Check encoder cable connection. If loose, tighten. If damaged replace.

SOLUTION #3: Check Encoder Wheel for tightness to shaft. If loose, use Allen-Wrench to tighten.

4. Panel lengths are consistently long or short when using Batch and Length Control Computer. I.e. all panels are 1/2" long or 1/2" short.

SOLUTION: Run calibration sequence

APPENDIX B
ELECTRICAL SCHEMATICS

ELECTRICAL SCHEMATICS

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