

OPERATION and MAINTENANCE MANUAL

U.S Patent NO. 5,394,722

BG7

7" Commercial Box Gutter Machine

www.NewTechMachinery.com

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CHAPTER 1 BG7 SPECIFICATIONS

SPECIFICATIONS

BG7 Dimensions:	Length-14' 6" Width-4'	(4.4m) (1.7m)	
	Height-4' 3"	(1.7m) (1.3m) w/Over Head Rack	
	2' 8"	(8m) w/o Over Head Rack	
	Weight-1800 lbs.	(820kg)	
SSQ on Trailer:	Length-21'	(7.7m)	
	Width-7'	(2.1m)	
	Height-6' 3"	(1.9m) with reel	
	Weight-4560 lbs.	(2069kg)	
Speed:	60 ft./min. Approx	. (18m/min.) Approx.	
Drive:	Hydraulically Driv	ven Polyurethane Rollers	
Shear:	Hydraulically Powered, hardened tool steel dies and blades w/l Recognition Proximity Sensor		
Hydraulic Fluid:	15 Gallons - 32AV	V	
Coil Width:	20" (500mm) Strai 24" (600mm) Bacl	ight Back, Hook, Inside Flange < Flange	
Materials Formed:	Painted Steel	26ga. to 22ga. (.4mm to .8mm) Painted, Galvanized, Aluminized	
	Painted Aluminum	a .032" to .050" (.8mm to 1.3mm)	
	Copper	20 oz. to 24 oz. ³ ⁄ ₄ Hard (.7mm to .8mm)	
Controls: Standard: Man Lim		nual Control Box w/Length Control nit Switch	
	Optional: Cor	nputer 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 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 your machine with a tarp to protect it but provide good ventilation to prevent condensation and rust.
- **3.** Keep your 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 your 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. Lubricate the drive gears a minimum of every 30 hours of operation. Use of an Open Gear Spray Lubricant is recommended.
- 8. Keep Arbor Cradles lubricated with Clear Grease.
- 9. Lubricate Arbor Nut 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. <u>CAUTION: Do not</u> <u>use harsh chemicals or solvents or damage will occur.</u>
- **12.** Lubricate both faces of the Shear Blades and Dies a minimum of once daily with Spray Lube. More should be added as needed before the cut edges begin to deteriorate.

CHAPTER 3 GENERAL MAINTENANCE

Recommended Lubricants and Fluids

The following lubricants are available from New Tech Machinery.

Spray Lube for:

Shear Blades, Dies, Entry Guide, Bead Roller Carriage Shafts, Acme Shafts and Mitre Gears Super Lube - Multi-Purpose Synthetic Aerosol Lubricant with Syncolon (PTFE) **NTM PN: LUBE-SPRAY** - 11oz can

Clear Grease for:

Arbor Cradles Synthetic Extreme Pressure, High Temperature Grease with Syncolon (PTFE) NTM PN: LUBE-GEL - 400 gram container

EP Grease for:

Arbor Nuts and Pillow Blocks Grease - Lubricants Type: Moly Ep Grease NTM PN: LUBE-GREASE - 14 Ounce Container

Open Gear Spray Lubricant for:

Main Drive Gears Open Gear and Wire Rope Lubricant NTM PN: LUBE-GEAR - 11 oz. Aerosol Can

Hydraulic Fluid (32AW) for: Hydraulic Tank **NTM PN: HYD-200-018** - 5 Gallons (4 Required)

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 you are using 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 your 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 1)

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, your machine will not run continuously in reverse.
- B. JOG-RUN Switch

This selector switch allows you to run the machine 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 you are 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-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 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)

You must pull the Emergency Stop-Power On button 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

(Figure 2)

- 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.

FUSES

(Figure 3)

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, you will lose all functions of the machine except Motor Start. **To replace this fuse:** Loosen all 4 cover screws and open the front panel of the Control Box. Locate the automotive style inline 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 4)

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.



Figure 1: Controls



Figure 2: Main Control Cable



Figure 3: Main Control Box Fuse



Figure 4: QCPP E 1-6 Fuse Location

REEL STANDS, REELS AND EXPANDABLE ARBORS

EXPANDABLE ARBOR

(Figure 5)

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 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 in 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 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" bolts 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 <u>making sure the threaded nut is on the</u> 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 5), find the "D" dimension that corresponds to the profile you are using.
- 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 15)



Figure 5: Expandable Arbor Set-Up

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 cradles on the reel rack. Keep the cradles lubricated with synthetic lube to minimize wear. (Figure 6)
- 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 6)

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.



Figure 6: Expandable Reel Assembly

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. <u>DO NOT</u> 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 6).
- 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 then remove the lifting device.
- 3. Rotate the Hold Down Bars (Figure 6) to the closed position and thread the handle onto the hold down bolt. If you are 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-adjustment will need to be made. Caution: Do Not over tighten Hold Down Bars. Drive and/or electrical system failure may occur.
- **4.** If you are going to transport the machine 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, you should also secure the coil around the outside edges through the inside diameter using a strap, rope, etc. to prevent the coil from telescoping (Figure 5).

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

CHAPTER 6 HYDRAULIC SYSTEMS

HYDRAULIC SYSTEMS

Maintenance

140°F (60°C).

(Figure 7)

The hydraulic system for your machine is a very durable and reliable system. 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. Check fluid level and bleed off air 3 Foamy fluid will cause a noisy pump and slow erratic operation of the system. The cause is usually low oil by pushing the shear down button and holding for 10 seconds. level or air in the system. Machine runs slow after continuous operation. Check Allow to cool down. Move to a 4 hydraulic fluid temperature, it should be no more than shaded area if possible.

CHAPTER 6 HYDRAULIC SYSTEMS



Figure 7: Hydraulic System – Overview

CHAPTER 6 HYDRAULIC SYSTEMS

SHEAR SOLENOID DRIVE SOLENOID









CHAPTER 7 DRIVE SYSTEM

DRIVE SYSTEM

The drive rollers are set at the factory and should not need adjustment. Over time, the chains will wear down causing them to get longer and the chain tensioning sprockets will need to be adjusted to keep the chain tight. If the chain is loose, follow the procedure below to tighten.

Chain tightening procedure:

- 1. Loosen the bolt(s) and jam nut(s) that secure the idle sprocket.
- 2. Tighten the adjustment screw(s) until the slack has been removed from the chain. Do not over-tighten the chain.
- 3. Re-tighten the bolt(s) and jam nut(s).



Figure 10: Tightening the Chain

CHAPTER 8 SHEAR ASSEMBLY

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 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.

SHEAR ADJUSTMENTS

The shear is adjusted at the factory, but it may become necessary to move the shear to better match the location of the gutter as it exits the machine.

Adjusting the height of the shear:

- **1.** Shut off power to the machine.
- 2. Loosen the two jam nuts and two bolts shown in the figure, but do not remove.
- 3. Turn the two adjustment screws to raise or lower the shear.
- 4. Re-tighten the bolts and jam nuts.



Figure 11: Shear Height Adjustment

CHAPTER 8 SHEAR ASSEMBLY

Adjusting the left-right position of the shear:

- 1. Shut off power to the machine
- 2. Remove the shear cover, then loosen the six "A" bolts but do not remove.
- 3. Use a large screwdriver to pry on the slots (Figure 12) until the shear is located correctly.
- 4. Re-tighten the "A" bolts, and replace the cover.

Removing the shear body:

If the gutter becomes damaged during forming it may be necessary to remove the shear body in order to get the gutter out of the machine. Follow the steps below.

- **1.** Shut off power to the machine.
- 2. Remove the shear cover, then remove the six "B" bolts.
- **3.** Grasp the handle and remove the shear body.
- **4.** To re-install, replace the shear body and the six "B" bolts. Tighten the bolts. Replace the cover.



Figure 12: Shear Left-Right Adjustment and Removal

CHAPTER 8 SHEAR ASSEMBLY

SHEAR 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.

Spray Lube for:

Shear Blades, Dies, Entry Guide, Bead Roller Carriage Shafts, Acme Shafts and Mitre Gears Super Lube - Multi-Purpose Synthetic Aerosol Lubricant with Syncolon (PTFE) **NTM PN: LUBE-SPRAY** - 11oz can

CHAPTER 9 ENTRY GUIDE & DRUM ASSEMBLY

ENTRY GUIDE AND DRUM ASSEMBLY

ENTRY GUIDE ADJUSTMENT



Figure 13: Entry Guide Adjustment

ENTRY DRUM ADJUSTMENT



Figure 14: Entry Drum Adjustment

CHAPTER 10 RUN OUT TABLES

RUN OUT TABLES

(Figure 15)

The Run-Out Table attaches to the Exit End of the Shear assembly, and is used to support the gutter 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.

- 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 attach the Run-Out Table Adapter angle to the table.
- **3.** Lift the attachment end of the table and insert the Run-Out Table adapter angle into the gap between the shear and the frame.
- **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.



Figure 15: Run Out Table

CHAPTER 11 POST-FACE KNIFE ROLLER ADJUSTMENT

POST-FACE KNIFE ROLLER

(Figure 16)

When changing the coil from steel to aluminum, or vice-versa, the post-face knife roller needs to be adjusted in order to maintain a quality gutter. To do this, follow the procedure below.

- 1. Remove the top cover closest to the shear.
- **2.** Locate the post-face knife roller.
- **3.** Loosen the bolt, insert a 5/32" allen wrench into the allen wrench hole in the shaft, and rotate the shaft until the black line on the shaft lines up with the black line on the aluminum block. The black line in the yellow paint is for steel, and the black line in the orange paint is for aluminum.
- 4. Re-tighten the bolt, and replace the cover.



Post-Face Knife Roller Detail

Figure 16: Post Face Knife Roller Adjustment

CHAPTER 12 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. You can hear the hydraulic system laboring and pushing the Red Shear Up Button does not return it to the top of stroke.
 - SOLUTION: Adjust the pressure switch (Figure 17) by turning the silver knurled sleeve "A" **counterclockwise** until the shear goes up. **Note**: If you turn the sleeve to far CCW, you will get problem #2 below on the next cut made.



DRIVE VALVE SHEAR VALVE PRESSURE SWITCH KNURLED SLEEVE "A" Figure 17: Pressure Switch Adjustment

CHAPTER 12 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 17) 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 you turn the knurled sleeve too far CW you will experience problem #1 above.

3. Shear is at the top of the stroke, you can hear the hydraulic system laboring and you cannot run the next panel.

SOLUTION: Remove the Shear Cover. Note the 2 Limit Switch Arms "A" (Figure 18). 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: 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 you hear a click and stop. Repeat this a few times until you can stop 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 you should be able to run the next panel.

CHAPTER 12 TROUBLESHOOTING



Figure 18: Limit Switch Adjustment

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 3 on page 10).
- SOLUTION #2: If you have a gasoline engine, check the condition of the battery. The control system requires 12 volts to operate properly. Replace or charge battery as required.

CHAPTER 13 **HOOK ASSEMBLY (OPTIONAL)**

HOOK ASSEMBLY (OPTIONAL)

(Figure 19)

The Hook Assembly is a self-contained assembly which can be added to a gutter machine. The New Tech machine is capable of running a straight back (with a bead) or hook type gutter profile from the same machine. The hook assembly and bead roller assembly can be moved in or out of position depending on the type of gutter desired.

Engaging or disengaging the hook

Before changing profiles, empty material from the forming area of the machine. To engage or disengage the hook assembly, simply loosen both "A" bolts. Slide the hook assembly toward the center of the machine to make a straight back profile or toward the back guide rod to make a hook profile. Retighten the "A" bolts.



EXIT

Figure 19: Hook Assembly Adjustment

Move the bead roller

(Figure 20)

The bead roller assembly must be moved up and out of the way for the hook profile on the mounting plate for a straight back profile. To move the bead roller assembly, loosen both bolt "B" and move the assembly up when running the hook profile and down when running the straight back profile. Retighten "B" bolts.

CHAPTER 13 HOOK ASSEMBLY (OPTIONAL)



EXIT VIEW (SHEAR NOT SHOWN)



PLC CONTROLLER



Figure 21: PLC Assembly



Figure 22: Serial Number Plate

Home

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



Figure 23: 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 ¹/₄" 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:

- 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.



Figure 24: 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

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).



Figure 25: Specify Job to Run First

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



Figure 26: Auto-Run Screen

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.

CALIBRATION		
Length of Last I50' (Enter Actual M	Part Produce 5 ^I /_{8"} leasured Leng	d: yth:
150'	5 3 / 16"	
Cancel	Help	Enter

Figure 27: 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.

APPENDIX A <u>PLC CONTROLLER</u>		
CALIBRATIO	N	
Enter Calibration Length to Run:		
Run Calibration Length: Start		
Cancel	Help	

Figure 28: 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.



Figure 29: Calibration Screen

Setup:

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

ľ	SETUP
l	Units of Measure: ft/in in mm Note: changing units of measure will clear all programmed jobs
l	Auxiliary Shear: OFF ON
	Home Security Settings Status

Figure 30: Setup Screen

In the Setup screen, the Units of Measure can be changed to Imperial units in either feet and 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 31: Status Screen

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.



Figure 32: 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.

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.

	COILS
	Enter password to edit coil length or press Continue.
	1234
Cancel	Continue

Figure 33: Coils Password Access Screen

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

COIL #1		
None	Change Color	
Remaining Length:	12345ft	
Purchased Length:	12345ft	
Coil #1 Coil #2	Coil #3	
Home	Length Calculate	

Figure 34: 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.

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 35: 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.



Figure 36: 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.

WEIGHT TO LENGTH CALCULATOR			
Material: 24 GAUGE STEEL			UGE STEEL
ID of C	oil:		20"
Width o	of Coil:		18"
Thickness of Coil:			2.625"
Estimated Length: 676 FT			676 FT
Done	The calculated va such New Tech no liability with th	lues are ex Machinery he use of t	stimates and as / can assume his calculator.

Figure 37: Length Calculator Screen

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

MATE	RIAL THIC	KNESS
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 38: 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 39: Coil Dimensions

ELECTRICAL SCHEMATICS

Drawing Number PLC-380-000 PLC-380-000	Sheet Number 1 2	<u>Description</u> Electrical Assembly – Parts List 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





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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 .1030"
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)



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



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	PUSH BUTTON (N.O.)
- <u></u>	PUSH BUTTON (N.C.)
\$	LIMIT SWITCH (N.O.)
~ å	LIMIT SWITCH (N.C.)
* <u></u>	PRESSURE SWITCH (N.O.)
→_ ↓	PRESSURE SWITCH (N.C.)
-(CR1)-	CONTROL RELAY COIL
	SOLENOID RELAY COIL
	SELECTOR SWITCH
	SPRING RETURN SELECTOR SWITCH
	MOMENTARY SWITCH
	ROTARY ENCODER



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