ProSeries
by Wood-Mizer

Semi-Automatic Toothsetter

035525 **rev. C.02**

Safety is our #1 concern! Read and understand all safety information and instructions before operating, setting up or maintaining this machine.

Form #1032

Table of Contents Section-Page

SECTION 1 GENERAL INFORMATION AND SAFETY

This symbol calls your attention to instructions concerning your personal safety. Be sure to observe and follow these instructions. This symbol accompanies a signal word. The word **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. **WARNING** suggests a potentially hazardous situation which, if not avoided, could result in death or serious injury. **CAUTION** refers to potentially hazardous situations which, if not avoided, may result in minor or moderate injury to persons or equipment. Read all safety instructions before operating this equipment and observe all safety warnings!

Warning stripes are placed on areas where a single decal would be insufficient. To avoid serious injury, keep out of the path of any equipment marked with warning stripes.

Read and observe all safety instructions before operating this equipment! Also read any additional manufacturer's manuals and observe any applicable safety instructions including dangers, warnings, and cautions.

Always be sure that all safety decals are clean and readable. Replace all damaged safety decals to prevent personal injury or damage to the equipment. Contact your local distributor, or call your Customer Service Representative to order more decals.

Always properly dispose of all by-products, including debris, coolant and oil.

Safety instructions are listed in this section by the following operations:

- Electrical Safety
- Blade Handling
- Machine Operation

1.1 Electrical Safety

DANGER! Make sure all electrical installation, service and/or maintenance work is performed by a qualified electrician and is in accordance with applicable electrical codes.

DANGER! HAZARDOUS VOLTAGE can cause shock, burns, or death. SHUT OFF & LOCK OUT POWER before performing service in any area of this machine. DO NOT restore power until all access panels are replaced and secured.

WARNING! Always turn off and disconnect power at control console AND at main supply circuit breaker before performing any service to the machine.

1.2 Blade Handling

WARNING! Always wear gloves and eye protection when handling bandsaw blades. Keep all persons away from area when coiling or carrying a blade.

1.3 Machine Operation

DANGER! Make sure all guards and covers are in place and secured before operating the toothsetter. Failure to do so may result in serious injury.

DANGER! Keep all persons away from moving parts when operating this machine. Failure to do so will result in serious injury.

DANGER! Always keep hands away from moving bandsaw blade. Failure to do so will result in serious injury.

WARNING! Always wear eye protection when operating this machine. Failure to do so may result in serious injury.

WARNING! Secure all loose clothing and jewelry before operating this machine. Failure to do so may result in serious injury or death.

1.4 Setter Components

See Figure 1-1. The major component and dimensions of the Semi-Industrial Setter are listed below.

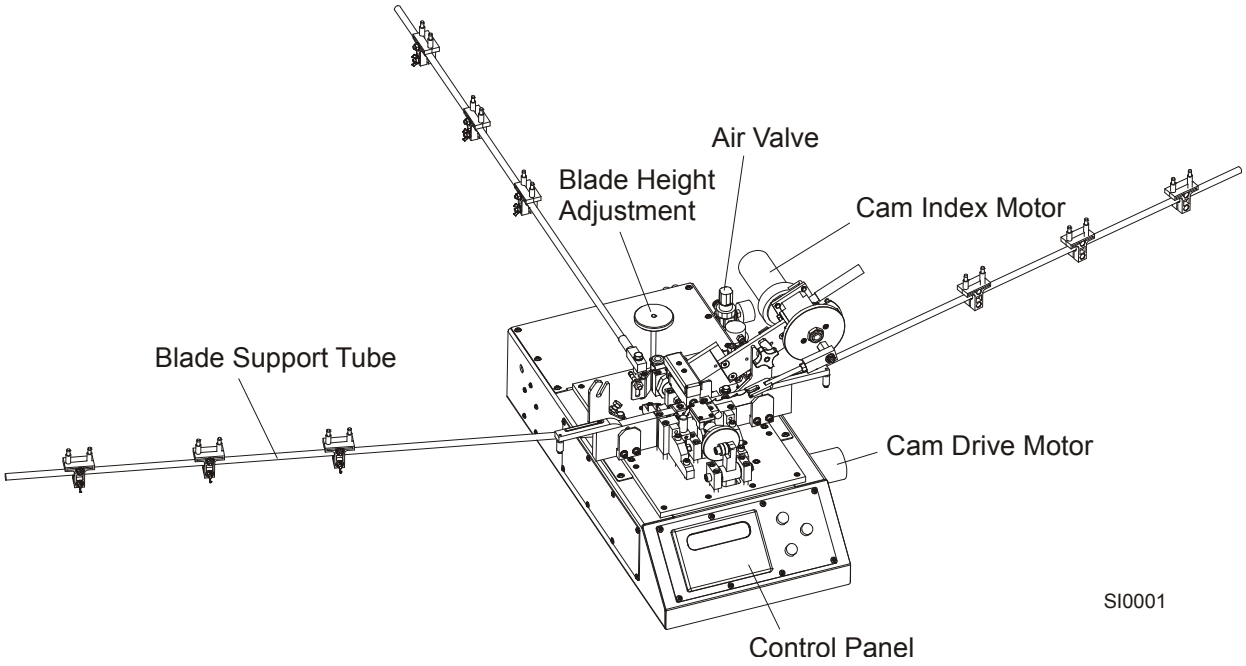


FIG. 1-1

1.5 Control Panel Components

See Figure 1-2. The control panel component locations and their functions are listed below.

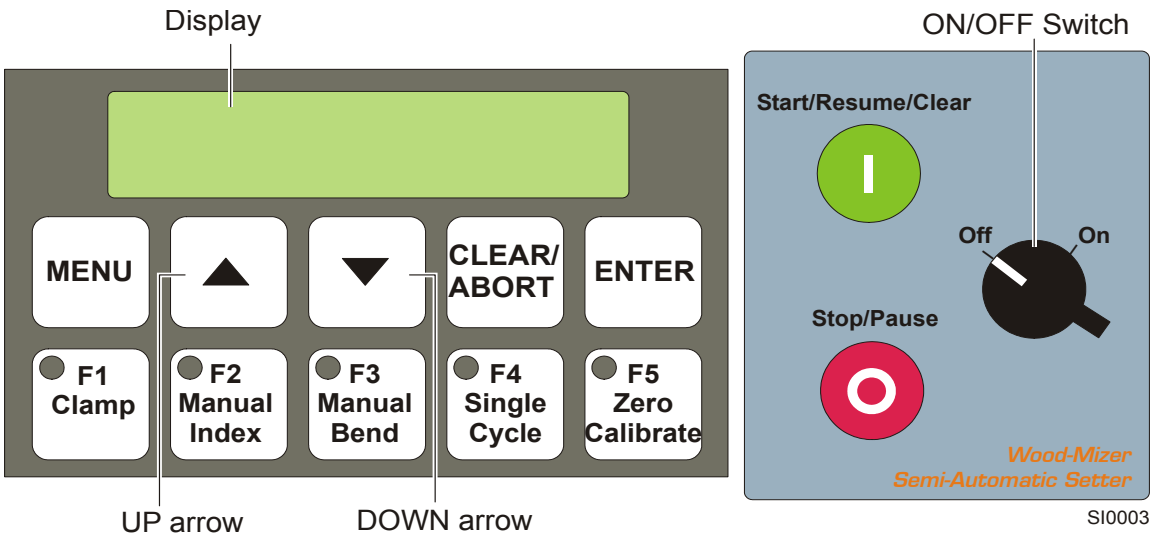


FIG. 1-2

On/Off Switch - turn the switch to the ON position to turn on electrical power to the machine.

Start/Resume/Clear - press to start or resume setting cycle; button also used to clear an error.

Stop/Pause - press to stop or pause machine.

Menu - press once to get to the menu.

Up arrow - press to select menu or option; used to increase values.

Down arrow - press to select menu or option; used to decrease values.

Clear/Abort - press once to clear the setting, cancel your action, or clear an error.

Enter - press once to confirm your choice.

F1 Clamp - press to close or open the blade clamp.

F2 Manual Index - press to move the blade to the next tooth.

F3 Manual Bend - used to bend the blade teeth manually regardless of set; the tooth set is not checked.

F4 Single Cycle - press to set the blade using the single cycle mode. The indexer pawl moves the blade. The blade is clamped and the tooth set is checked. The setter sets the tooth if necessary.

F5 Zero Calibrate - used during calibration of the blade clamp. *See Section 3.1 Setter Calibration*.

1.6 Start Up Modes

Press the MENU button once to get to the menu selection mode. Press the UP or DOWN button twice to find the MODE menu.

The following options are available in the MODE menu:

Set Single Clamp - The setter clamps and checks the blade tooth. The tooth is set if necessary. The blade is unclamped, and moved to the next tooth. The setter skips the pattern recognition while using the Set Single Clamp mode.

Set Double Clamp - Just like using the Set Single Clamp mode, but the blade is clamped once more after releasing and checked for the tooth set. The pattern recognition is turned off. The Set Double Clamp mode is more accurate but more time-consuming.

Pattern Single Clamp - The mode similar with the Set Single Clamp mode, but the setter checks the teeth pattern. See System Parameters, for how to set the maximum number of pattern errors (only 1 in most cases). When the number of possible errors is exceeded, the setter stops the setting process and the "Error --- Blade Set Pattern" message appears.

Pattern Double Clamp - Using the Pattern Double Clamp mode, the setter works like using the Pattern Single Clamp mode, but the blade is released and clamped again to check the tooth set. The Pattern Double Clamp mode takes more time to set the whole blade but it is more accurate.

Inspection - After the Inspection mode has been selected, the setter checks the tooth set only. The process is stopped when the number of pattern errors has been exceeded.

NOTE: The Pattern Single Clamp and Pattern Double Clamp modes can be used only when the tooth setter has been set to push every tooth of the blade.

Push the ENTER button to select the mode you want the setter to operate.

1.7 Blade Settings

Press the MENU button on the control panel once to enter the BLADE SETTINGS mode. Use the UP or DOWN arrows if necessary. Push the ENTER button to enter the settings.

The following options are available in the BLADE SETTINGS menu:

No. of teeth to set - The number of teeth to be set. Press ENTER to see the "Qty Teeth To Set #" message. Use the UP and/or DOWN arrows to enter the number of teeth to be set. See **Table 1-1** below. **NOTE:** Enter the number of teeth divided by three if the setter pushes every third tooth of the blade.

Upper Set Limit - The desired tolerance for the upper set. When entered the "Upper Set Limit #" appears. Use the UP and/or DOWN arrows to set the limit value. The upper set limit is the upper limit of the tolerance for the blade tooth set. If the tooth set exceeds the upper limit, the setter adds the tooth to the group of teeth with the incorrect set. The setter stops when the number of set errors is exceeded.

Lower Set Limit - The desired tolerance for the lower set. When entered the "Lower Set Limit #" appears. Use the UP and/or DOWN arrows to set the limit value. The lower set limit is the lower limit of the tolerance for the blade tooth set. If the tooth set is below the limit, the setter adds the tooth to the group of teeth with the incorrect set. The setter stops when the number of set errors is exceeded.

Maximum Raker Set - The desired tolerance for raker set teeth. When entered the "Max. Raker Set #" appears. Enter the desired tolerance for rakers. Use the lowest possible tolerance that still allows the setter to efficiently operate. If the raker set exceeds the provided limit, the tooth set error appears.

See Table 1-1. Recommended blade settings are shown below.

Blade Type [1]	Blade Thickness	Number of teeth (standard blades) [2]	Lower Set Limit (Value Entered)	Upper Set Limit (Value Entered)	Raker Set (Value Entered)
175 158 10 S	.035"	180	0.017" (17.0)	0.019" (19.0)	0.009" (9.0)
274 158 10 S	.042"	180	0.020" (20.0)	0.022" (22.0)	0.009" (9.0)
274 158 9 S	.042"	180	0.019" (19.0)	0.021" (21.0)	0.009" (9.0)
275 158 9 S	.042"	180	0.020" (20.0)	0.022" (22.0)	0.009" (9.0)
375 158 10 S	.045"	180	0.024" (24.0)	0.026" (26.0)	0.009" (9.0)
375 158 9 S	.045"	180	0.020" (20.0)	0.022" (22.0)	0.009" (9.0)
376 158 13 S	.045"	180	0.024" (24.0)	0.026" (26.0)	0.009" (9.0)
376 158 10 S	.045"	180	0.024" (24.0)	0.026" (26.0)	0.009" (9.0)
376 158 9 S	.045"	180	0.020" (20.0)	0.022" (22.0)	0.009" (9.0)
475 158 9 S	.055"	180	0.024" (24.0)	0.026" (26.0)	0.009" (9.0)
475 158 10 S	.055"	180	0.027" (27.0)	0.029" (29.0)	0.009" (9.0)
476 158 10 S	.055"	180	0.027" (27.0)	0.029" (29.0)	0.009" (9.0)
476 158 13 S	.055"	180	0.027" (27.0)	0.029" (29.0)	0.009" (9.0)
656 158 12 S	.038"	240	0.018" (18.0)	0.020" (20.0)	0.009" (9.0)

TABLE 1-1

[1] Only standard blade types are shown.
[2] Increase the number of teeth to be set by 1 or 2 to make sure all the teeth have been checked and set.

1.8 System Parameters

Press the MENU button once. Push the DOWN arrow button to find the SYSTEMS PARAMETERS menu. Press ENTER to see parameters needed to be set.

When selected, the following parameters can be set:

Max Pattern Errors - push the ENTER button to show to the "Max Pattern Errs #" parameter. Use the UP and DOWN arrows to set the maximum number of pattern errors for the setting process. When the number of errors is exceeded while setting the blade, the setter stops and the "Error -- Bld !! Tooth Set #" message appears. Inspect the blade and correct the pattern. The most common place where the pattern error is found is the weld area on the blade. To cancel the error, press the green Start/Resume button.

Max Tooth Set Errors - push the ENTER button to enter the "Max Set Errors #" parameter. Use the UP and DOWN buttons to adjust the maximum number of teeth that can be set incorrectly in the setting process. When the number of errors is exceeded the setting process will be stopped. The "Error -- Bld !! Tooth Set #" message appears. The # mark is the current tooth set. **NOTE:** To decrease set, bend the tooth back with the slot in the correction tool provided. Press the green Start/Resume button to cancel the error. Push the F3 Manual Bend button to allow the setter to set the tooth again. To add set, press the F3 Manual Bend button.

Dpy Imperial/MM - when selected, the "Standard Selected" appears, followed by the current selection: Imperial or Metric. Use the UP and DOWN arrows to switch the units of measure. Press ENTER to confirm. **NOTE:** Always turn the setter off after changing the units of measure. Turn the setter on to use new units of measure.

1.9 Diagnostic & Setup

To enter the DIAGNOSTIC/SETUP menu, press the MENU button. Press the UP arrow once, and push ENTER to confirm. Use the UP and DOWN arrows to switch options.

The following options are available in the DIAGNOSTIC/SETUP menu:

Raw A/D value - technical specifications.

Current Zero Cal. - technical specifications.

Right Index Prox - indicates the right indexer proximity sensor status: ON or OFF.

Left Index Prox - indicates the left indexer proximity sensor status.

Indexer Home Prox - indicates the indexer cam proximity sensor status.

Cam Home Prox - indicates the drive cam proximity sensor status.

Linear Sensor Adjust - indicates the linear sensor adjustment status. *See Section 4.1 Sensor Adjustment*, for the adjustment procedure.

System Tooth Counter - indicates the total number of blade teeth processed. The bottom line shows the last four digits of the number. The upper line shows the first digits of the number. Example: High Count 3, Low Count is 2117 - 32.117 teeth have been processed.

Push the ENTER button after selection is complete to check the option status.

SECTION 2 OPERATION

2.1 Machine Setup

1. Install the blade to the setter. Rest the blade on the inside of the two blade guides and in between both blade clamps. Center the blade on the setter stand. Position the three adjustable blade guide supports so they lightly touch the inside of the blade. The adjustable guides should lightly support the blade and keep it from wobbling.

2. Use the blade height knob to adjust the blade height so the bottom of the gullet is aligned with the top of the blade clamps.

   See Figure 2-1.

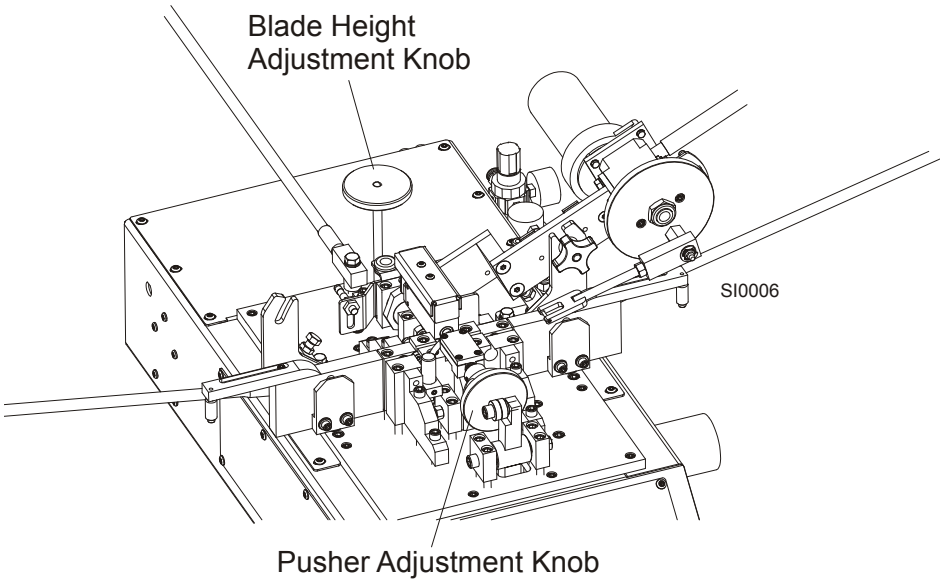


FIG. 2-1

3. Adjust the pusher pin. To adjust, manually rotate the pusher adjustment knob. Turn the pusher adjustment knob counterclockwise to increase the pusher pin force, turn the knob clockwise to decrease the force. Make sure the tooth is not being bent too much. Read the display to check the tooth set while adjusting.

   IMPORTANT! Avoid pinching fingers or hand when turning the cam.

   DANGER! Keep all persons away from moving parts when operating this machine. Failure to do so will result in serious injury.

4. Adjust the index ramp. The push pawl should push one tooth at a time. To adjust, loosen the blade ramp set screw. Slide the blade ramp as necessary and retighten the set screw.

   The pawls should contact the point of the tooth where the face and gullet meet. Manually rotate the index cam until the pawl is against the tooth radius. Loosen the index pawl adjustment nut to position the pawl as necessary. Retighten the nut when adjustment is complete.

2.2 Preliminary Setup

1. Clean the machine as needed with a solution of 1 part liquid Dawn detergent to 9 parts water. Use an air hose to blow any dust or debris from the blade clamp and up/down components.

   WARNING! Never use WD-40 or any other non-specified lubricant to clean the machine.

   Keep liquid away from the sensor assembly.

2. Make sure the voltage selector plate is set properly before turning on electrical power to the setter.

   NOTE: The setter can be powered with 115 Volts for North America and 230 Volts for Europe. Check the voltage selector plate position at the rear of the setter (with the power cord unplugged). The number you can read on the plate indicates the current voltage you can use. Switch the plate as necessary. To switch the plate, slide the plastic cover to access the plate. Use a screwdriver to remove the voltage selector plate located under the fuse. Flip and replace the voltage selector plate so the voltage number remains at the top of the plate. Slide the plastic cover back to secure the fuse and the plate.

   See Figure 2-2.

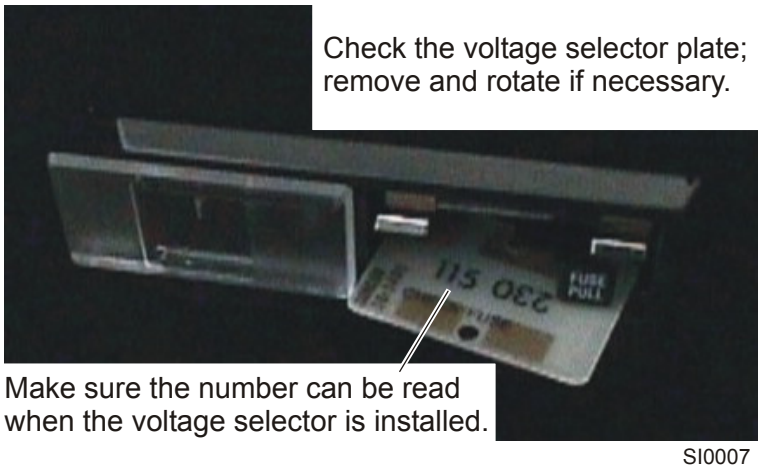


FIG. 2-2

IMPORTANT! Replace the fuse located above the voltage selector plate when the plate is switched. Use the 3 Amp fuse when the setter is powered with 115 Volts. Replace the 3 Amp fuse with the provided 2 Amp fuse if 230 Volts are used to power the unit.

3. Plug the power cord in the socket at the rear of the setter.

4. Locate the air assembly at the rear right side of the setter. Connect the incoming air supply line to the fitting. Make sure the air gauge indicates 60 P.S.I. Adjust the pressure if needed. To adjust the pressure, lift the black cap located behind the air gauge. Turn the cap clockwise to increase pressure, turn the cap counterclockwise to decrease pressure. Push the cap down to secure when adjustment is complete.

   See Figure 2-3.

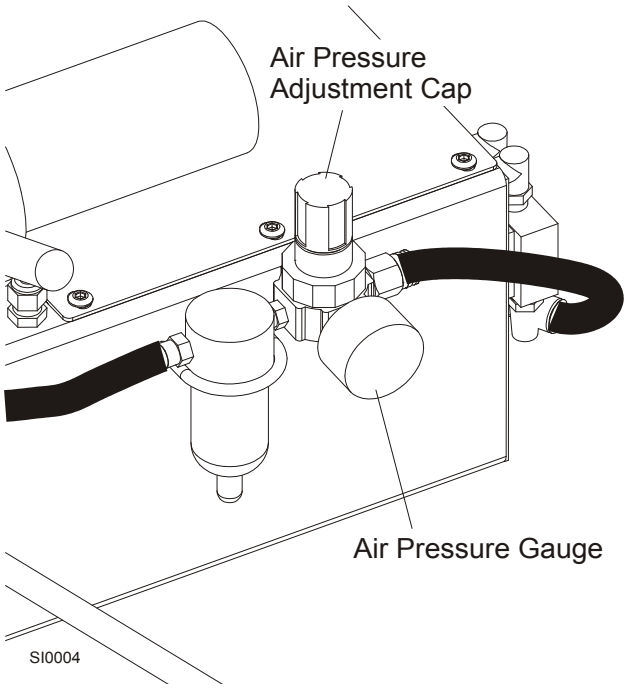


FIG. 2-3

5. Turn the ON/OFF switch to the ON position.

6. Calibrate the setter if necessary. *See Section 3.1 Setter Calibration*.

7. Make all the adjustments necessary to start the setting operation. *See Sections 1.6 through 1.8.*

2.3 Machine Operation

1. Clean the blade and deburr before putting in the toothsetter. Otherwise, sap buildup on the blade or tooth will give false set readings. Metal burrs created by sharpening will also cause false readings.

2. Mount the blade in the toothsetter. Place blade between the clamping plates and on the three guide assemblies. Use the weld as a reference point for starting.

   See Figure 2-4. Position the tooth in front of the sensor pin so its edge is approximately .0625" (1.6mm) away from the edge of the pusher pin.

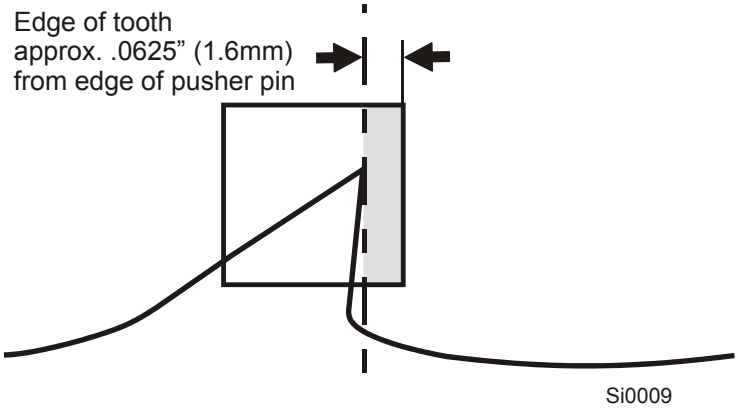


FIG. 2-4

3. Turn the ON/OFF switch to the ON position.

4. Now all of the adjustments have been made. Push START to begin the setting operation. All values will remain as set.

5. Closely monitor the setter during operation.

   If the number of set errors is exceeded, the setter is stopped. To correct the tooth set, press the CLEAR/ABORT button to loosen the clamp. Bend the tooth back with the slot in the correction tool provided. Clamp the blade and push the F3 MANUAL BEND button to set the tooth. Recheck the tooth set. If okay, push the START button to continue the setting operation.

6. The machine will automatically stop after the setting operation has been completed.

7. Remove the blade and invert it.

8. Swing the index motor assembly to the other side. Repeat the setting operation.

SECTION 3 MAINTENANCE

3.1 Setter Calibration

To calibrate:

1. Clean each clamp block with air. If oily, wipe dry with a clean rag.

   WARNING! Never spray a liquid on or near the sensor assembly.

2. Inspect the blocks for chips and/or other damage. Replace if necessary.

3. Place the calibration plate into the clamp assembly. Position the calibration plate so the top of the plate is slightly above the top of the sensor pin.

4. Press the F1 Clamp button on the control panel to clamp the calibrate plate.

5. Press the F5 Zero Calibrate button to calibrate the setter.

   NOTE: If the "Error -- CAL Clamp Zero CAL Block" message appears, you need to adjust the sensor first. *See Section 4.1 Sensor Adjustment*, for the adjustment procedure.

6. With the calibration plate still clamped, manually retract the sensor pin and insert the .024" diameter gauge pin between the calibration plate and the sensor pin. If the display does not indicate .024 (±.001), the sensor is malfunctioning and should be replaced.

7. Hold the calibrate plate with the tips of your fingers. Press the F1 Clamp button to unclamp the calibration plate. Remove the calibration plate.

3.2 Miscellaneous

1. Check the chain every 40 hours of operation. Lubricate if needed.

2. Check chain tension periodically. Adjust the chain tension if necessary.

3. Grease the threads on the up/down height adjustment rods with a heavy axle grease every 40 hours of operation.

SECTION 4 ALIGNMENT

Check and align the setter each time the linear sensor is replaced.

4.1 Sensor Adjustment

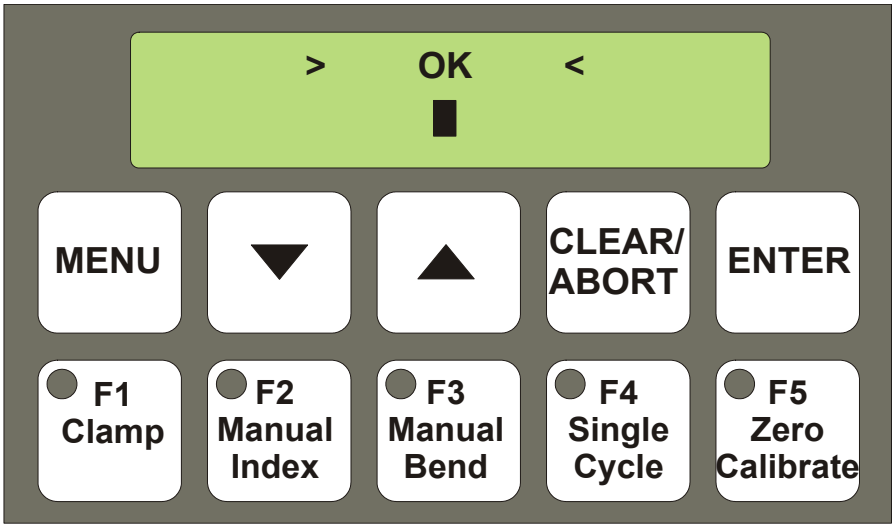
1. Turn the ON/OFF switch to the ON position.

2. Check the air pressure. Make sure the air pressure gauge indicates 60 P.S.I. Adjust the pressure if necessary.

3. Place the calibration plate in the setter clamp assembly. (Use the appropriate calibration plate as thick as the blade you want to set.) Keep the upper edge of the plate and the sensor pin level.

4. Press the MENU button. Push the UP arrow once to enter the DIAGNOSTIC/SETUP menu and press the ENTER button. Press the UP button once to select the LINEAR SENSOR ADJUST menu. Press ENTER again to confirm.

   See Figure 4-1. The sensor is adjusted properly if the black mark is located between the arrows on the display.



SI0002-1

FIG. 4-1

NOTE: If the black mark is not located between the arrows, the sensor needs adjustment.

5. Remove the two screws securing the sensor guard and remove the sensor guard.

See Figure 4-2.

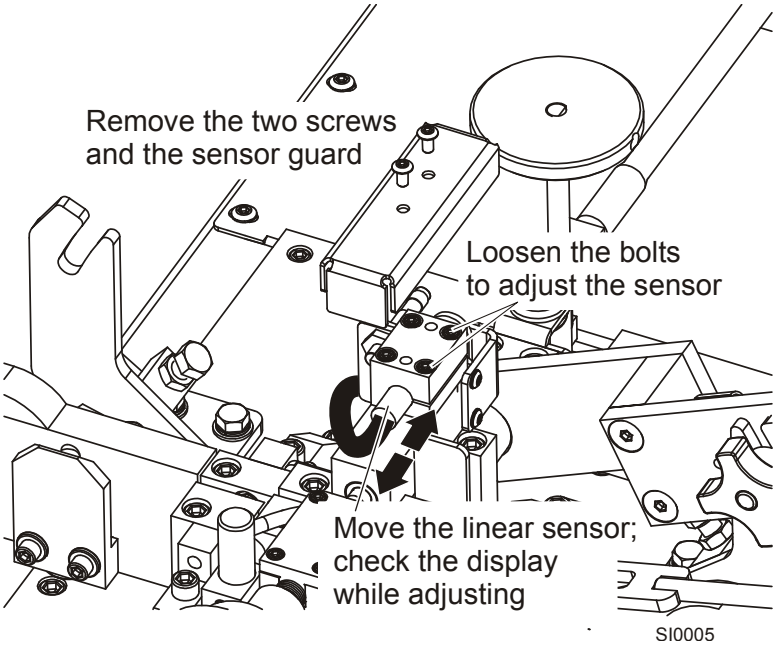


FIG. 4-2

6. Loosen the two bolts securing the linear sensor. Move the linear sensor back and forth to place the black mark between the arrows on the display.

7. Tighten the mounting screws to secure the linear sensor when adjustment is complete.

8. Press CLEAR/ABORT to leave the adjustment option.

SECTION 5 TROUBLESHOOTING

5.1 Error Messages

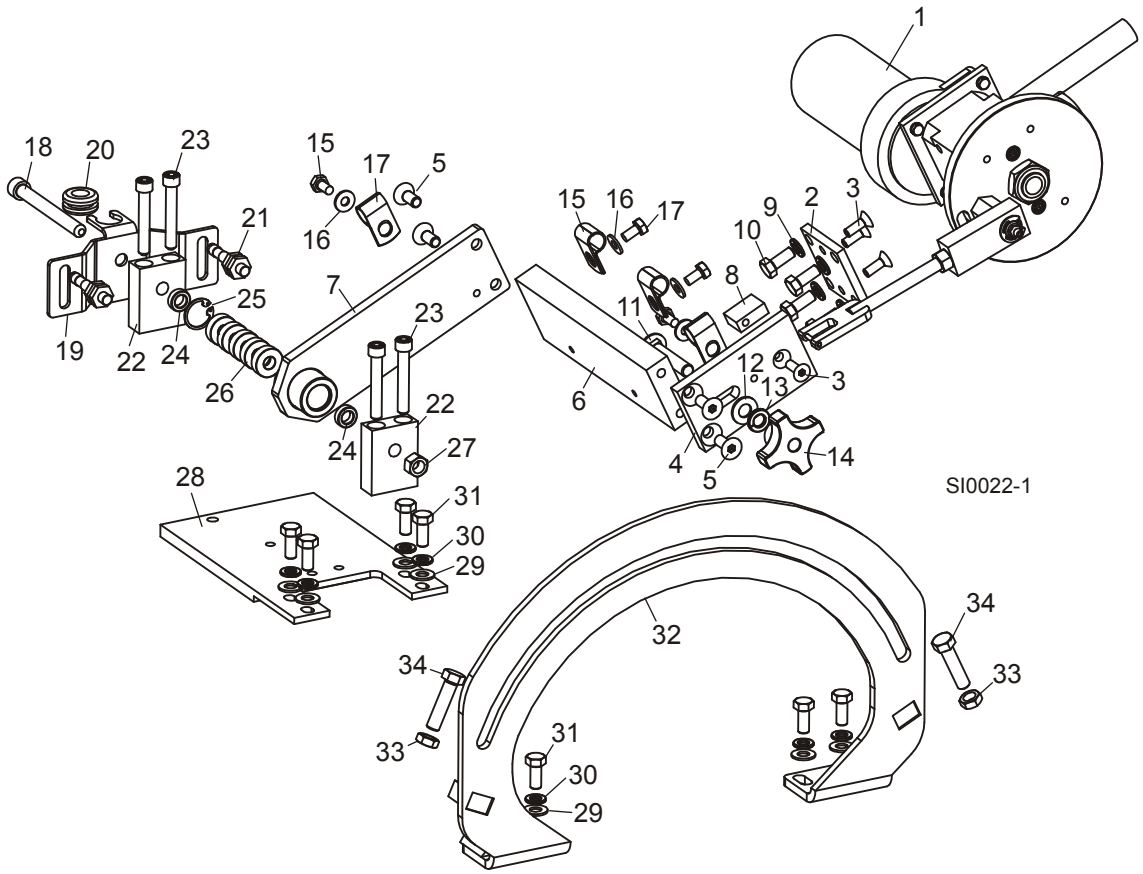
See Table 5-1. The possible error messages and their causes are listed below:

MESSAGE	CAUSE	SOLUTION
Error --- A/D A/D Failure	Power supply failure. A/D module has broken. Linear sensor is out of range.	Check connecting cable. Check the A/D module connections. Replace if necessary. Adjust the linear sensor. *See Section 4.1*
Error --- IDX Home Sensor	Circuit breaker failure. Proximity sensor is not adjusted. Index motor is not plugged.	Check the 3 Amp circuit breaker located at rear of the setter. Turn on the circuit breaker or replace if necessary. Adjust the proximity sensor. Plug the indexer motor.
Error --- IDX Not Fully Seated	Indexer is not seated properly. (Proximity sensor light is off).	Adjust the indexer assembly. Check if the proximity sensor light is on.
Error --- CAM Home Sensor	Circuit breaker failure. Cam proximity sensor not adjusted Cam motor is unplugged.	Check the 3 Amp circuit breaker located at rear of the setter. Reset the circuit breaker or replace if necessary. Adjust cam proximity sensor. Check if the proximity sensor light is on. Plug the cam motor.
Error --- Cal Clamp Zero CAL Block	While calibrating: metal pattern block is not clamped.	Clamp the metal pattern block to adjust the sensor pin.
Error --- Cal Sensor Out of Range	Linear sensor is out of range.	Adjust the linear sensor. *See Section 4.1*
Error -- Sensor Return Zero	Sensor pin is stuck.	Inspect the sensor pin. Clean the sensor if necessary.
Error --- Bld Tooth Set	Tooth set is incorrect.	Adjust the pusher. Inspect the blade.
Error --- Bld Set Pattern	Tooth set pattern is not correct.	Inspect the blade teeth. Correct the teeth pattern.
Lower Set Limit >= Upper Set Limit	Lower tooth set limit is above the upper limit.	Increase the upper tooth set limit. OR decrease the lower tooth set limit.
Raker Limit >= Lower Set Limit	Raker limit is above the lower limit.	Increase the lower tooth set limit. OR decrease the raker tooth set limit.

TABLE 5-1

SECTION 6 REPLACEMENT PARTS

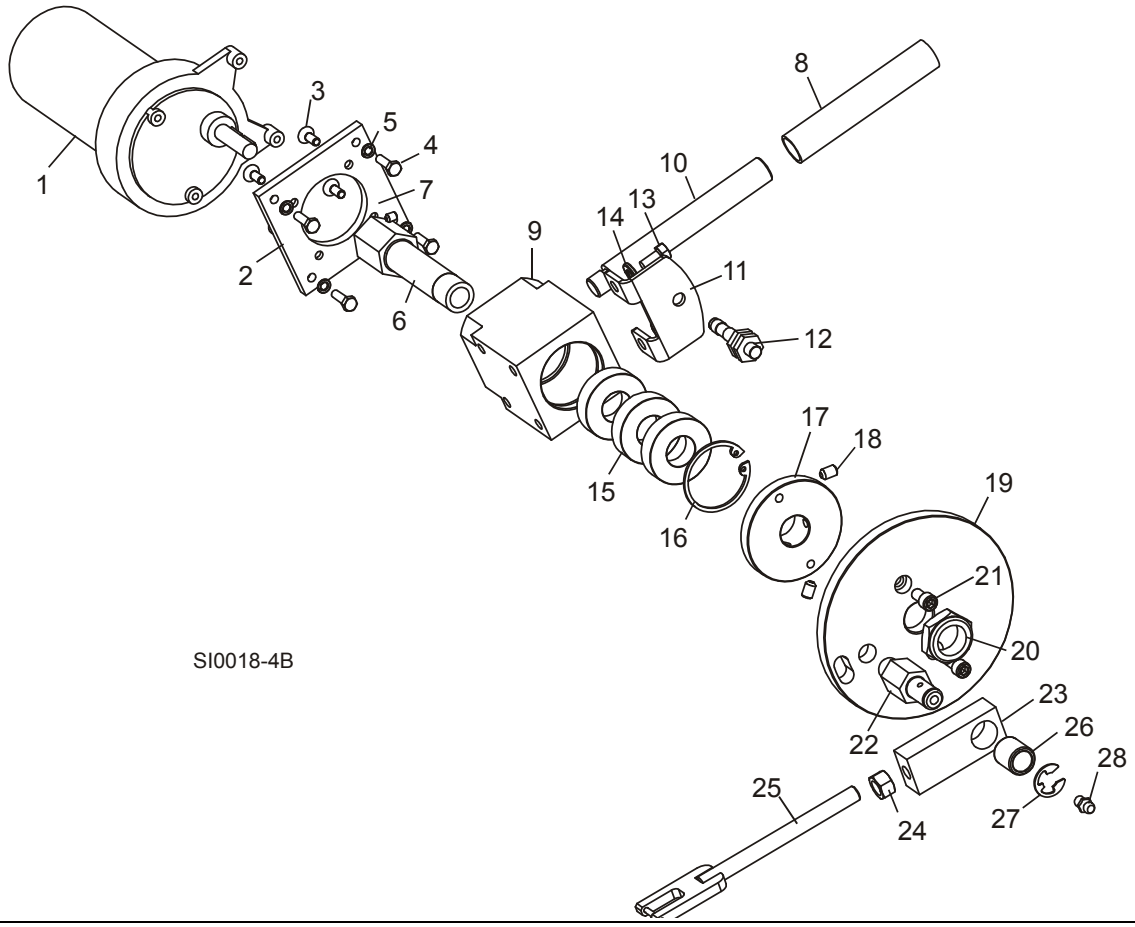
6.1 Pivoting Index Assembly



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	INDEX ASSEMBLY, PIVOTING	037999	1	
1	Index Motor Assembly Parts (*See Section 6.2*)			
2	Plate, Motor Mount	035483	1	
3	Bolt, 1/4-20 x 3/4” Flat Socket Head Stainless Steel	F05005-70	4	
4	Plate, Upper Index Support	037995	1	
5	Bolt, 5/16-18 x 3/4” Flat Socket Head	F05006-95	4	
6	Spacer, Index Arm	037996	1	
7	Arm Wldmnt, Index Pivot	037998	1	
8	Block, Index Motor Support	035503	1	
9	Washer, 5/16” Split Lock	F05011-13	4	
10	Bolt, 5/16-18 x 3/4” Hex Head Grade 2	F05006-5	4	
11	Bolt, 3/8-16 x 2” Full Thread Carriage Head	F05007-22	1	
12	Washer. 3/8” SAE Flat	F05011-3	1	

13	Washer, 3/8” Split	F05011-4	1	
14	Knob, 4Arm 3/8-16 Thru Hole	035505	1	
15	Bolt, 1/4-20 x 1/2” Hex Head	F05005-15	4	
16	Washer, 1/4” SAE Flat	F05011-11	4	
17	Clamp, 1/2” EMT Coated	P07584	4	
18	Bolt, 3/8-16 X 3 1/2” Socket Head	F05007-111	1	
19	Bracket, Index Pivot Home	035521	1	
20	Grommet, 1/2” I.D. x 3/4” O.D. Rubber	035523	1	
21	Proximity Sensor, 8mm Inductive Shid	050084	2	
22	Block, Index Arm Pivot	035469	2	
23	Screw, 5/16-18 x 2” Socket Head	F05006-87	4	
24	Spacer, Bearing	S32032	2	
25	Ring, 7/8” Inside Retaining	F04254-23	1	
26	Bearing, R6-2NSL SRI-2 ABEC-1	P10688	5	
27	Nut, 3/8-16 Hex Lock	F05010-25	1	
28	Plate, Index Mounting	037994	1	
29	Washer, 5/16” SAE Flat	F05011-17	8	
30	Washer, 5/16” Split	F05011-13	8	
31	Bolt, 5/16-18 x 3/4” Hex Head	F05006-5	8	
32	Support Weldment, Index	037992	1	
33	Nut, 3/8-16 Hex Jam	F05010-29	2	
34	Bolt, 3/8-16 x 1 1/2” Full Thread Hex Head	F05007-17	2	

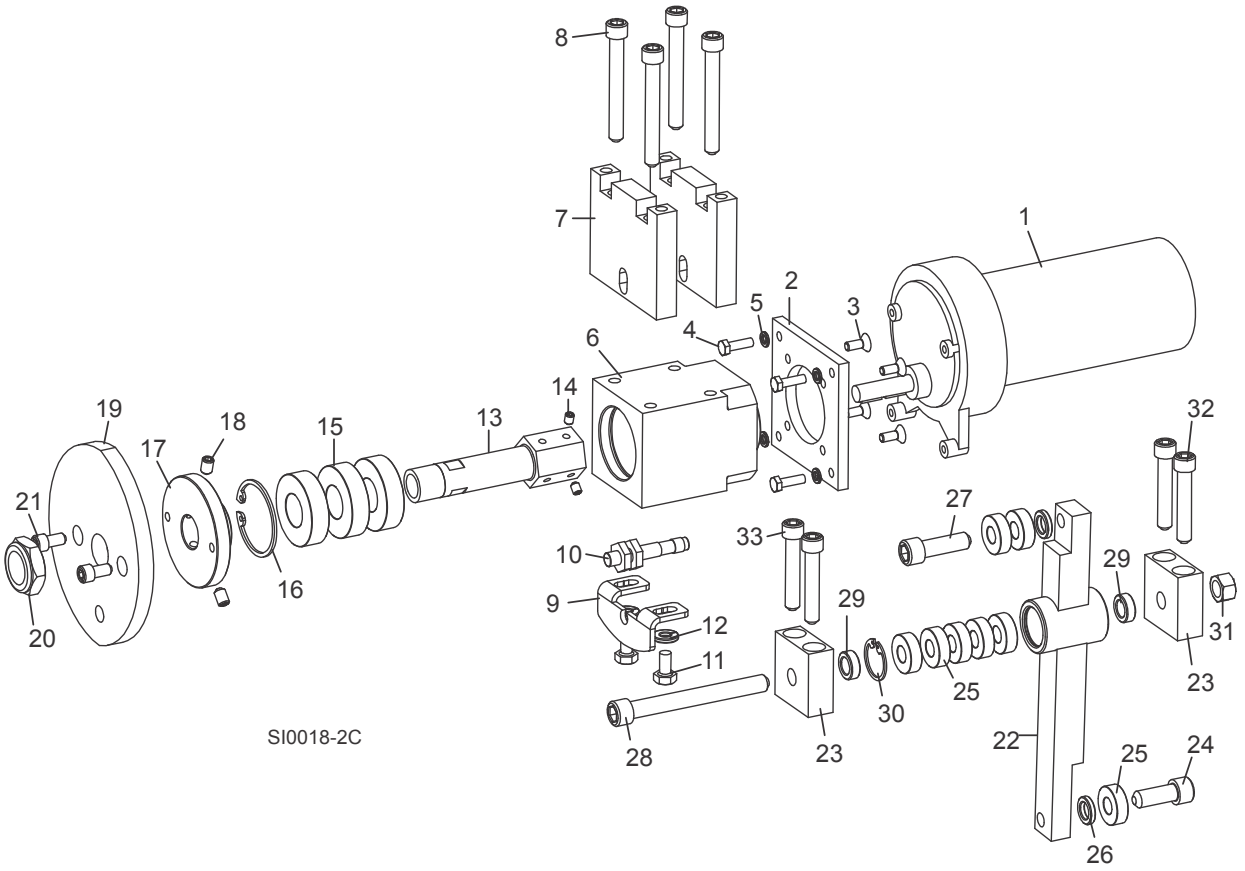
6.2 Pivoting Index Motor Assembly



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	MOTOR ASSEMBLY, SAS INDEX	035486	1	
1	Motor Assembly, 24V 60RPM Gear	035659	1	
2	Plate, SAS Motor Mount	035478	1	
3	Bolt, #10-24 x 1/2” Socket Head	F05004-61	4	
4	Bolt, #10-32 x 5/8” Hex Head	F05004-152	4	
5	Washer, #10 Split Lock	F05011-20	4	
6	Shaft, SAS Drive	035475	1	
7	Screw, #10-32 x 1/4” Socket Head	F05004-67	2	
8	Grip, 5/8” I.D. Hand	004742	1	
9	Housing, SAS Bearing	035476	1	
10	Handle, Index Pivot	035522	1	
11	Bracket, Index Proximity Sensor	035499	1	
12	Proximity Sensor, 8mm Inductive Shid	050084	1	
13	Bolt, 1/4-20 x 1/2” Hex Head	F05005-15	2	
14	Washer, 1/4” Split Lock	F05011-14	2	

15	Bearing, R12-2 NSL	P32044	3	
16	Ring, 1 5/8” Inside Retaining	F04254-22	1	
17	Plate, Cam	S32048	1	
18	Screw, 1/4-20 x 3/8” Socket Head Cup Point Set	F05005-47	2	
19	Plate, SAS Cam	060413	1	
20	Nut, 3/4-10 Nylon Lock Half	F05010-122	1	
21	Bolt, 1/4-20 x 1/2” Socket Head	F05005-39	2	
22	Shaft, SAS Index Pivot	035482	1	
	Pawl Assy, SAS Push	035498	1	
23	Block, SAS Push Pawl	035489	1	
24	Nut, 3/8-24 Hex	F05010-123	1	
25	Pawl Weldment, SAS Push	035488	1	◆
26	Bearing, 1/2” I.D. Needle	P30253	1	
27	E-clip, 1/2” Shaft	P10649	1	
28	Fitting, 1/4-28 Grease	P05060	1	

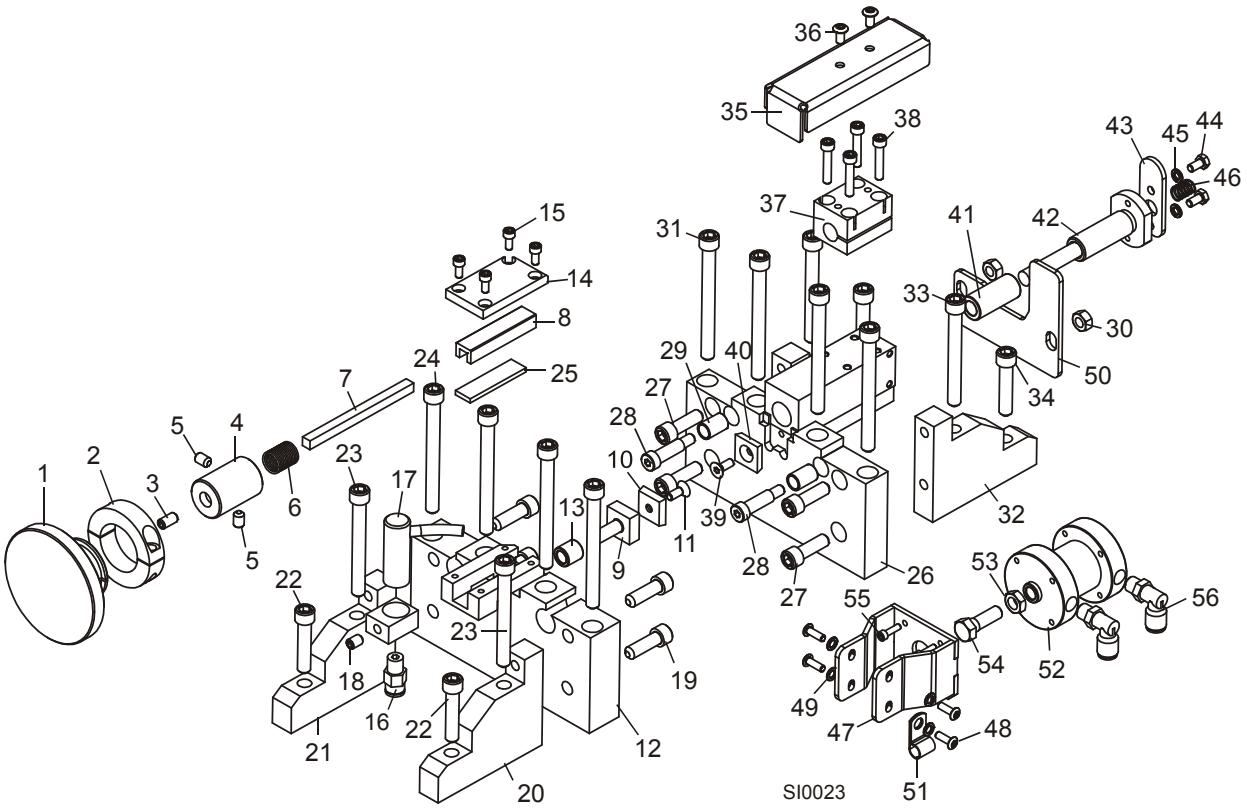
6.3 Cam Drive Unit Assembly



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	CAM DRIVE ASSEMBLY, SAS	035480	1	
1	Motor Assembly, 24V 60 RPM Gear	035659	1	
2	Plate, SAS Motor Mount	035478	1	
3	Bolt, #10-24 x 1/2” Flat Socket Head	F05004-61	4	
4	Bolt, #10-32 x 5/8” Hex Head	F05004-152	4	
5	Washer, #10 Split Lock	F05011-20	4	
	Housing Assembly, SAS Bearing	035479	1	
6	Housing, SAS Bearing	035476	1	
7	Riser, Cam Housing	S35047	1	
8	Bolt, 5/16-18 x 2 1/2” Socket Head	F05006-60	4	
9	Bracket, Index Proximity	035520	1	
10	Proximity Sensor, 8mm Inductive Shid	050084	1	
11	Bolt, 1/4-20 x 1/2” Hex Head	F05005-15	2	
12	Washer, 1/4” Split Lock	F05011-14	2	
13	Shaft, SAS Drive	035475	1	

14	Bolt, #10-32 x 1/4” Socket Head	F05004-67	2	
15	Bearing, R12-2NSL	P32044	3	
16	Ring, 1 5/8” Inside Retaining	F04254-22	1	
17	Plate, Cam	S32048	1	
18	Screw, 1/4-20 x 3/8” Socket Head Cup Point Set	F05005-47	2	
19	Cam, SAS Set	035504	1	
20	Nut, 3/4-10 Nylon Lock Half	F05010-122	1	
21	Bolt, 1/4-20 x 1/2” Socket Head	F05005-39	2	
	ARM ASSEMBLY, PUSHER PIVOT	A32054	1	
22	Arm Weldment, Cam Pivot	032349	1	
23	Block, Pivot	S32033	2	
24	Bolt, 3/8-16 x 1” Socket Head	F05007-52	1	
25	Bearing, R6-2NSL SRI-2 ABEC-1	P10688	8	
26	Spacer, Pusher Arm	S32053	2	
27	Bolt, 3/8-16 x 1 1/4” SHC BO	F05007-150	1	
28	Bolt, 3/8-16 X 3 1/2” Socket Head	F05007-111	1	
29	Spacer, Bearing	S32032	2	
30	Ring, 7/8” Inside Retaining	F04254-23	1	
31	Nut, 3/8-16 Hex Lock	F05010-25	1	
32	**BOLT, 5/16-18 X 1 3/4” SOCKET HEAD**	F05006-65	4	

6.4 Front & Back Clamp Assembly

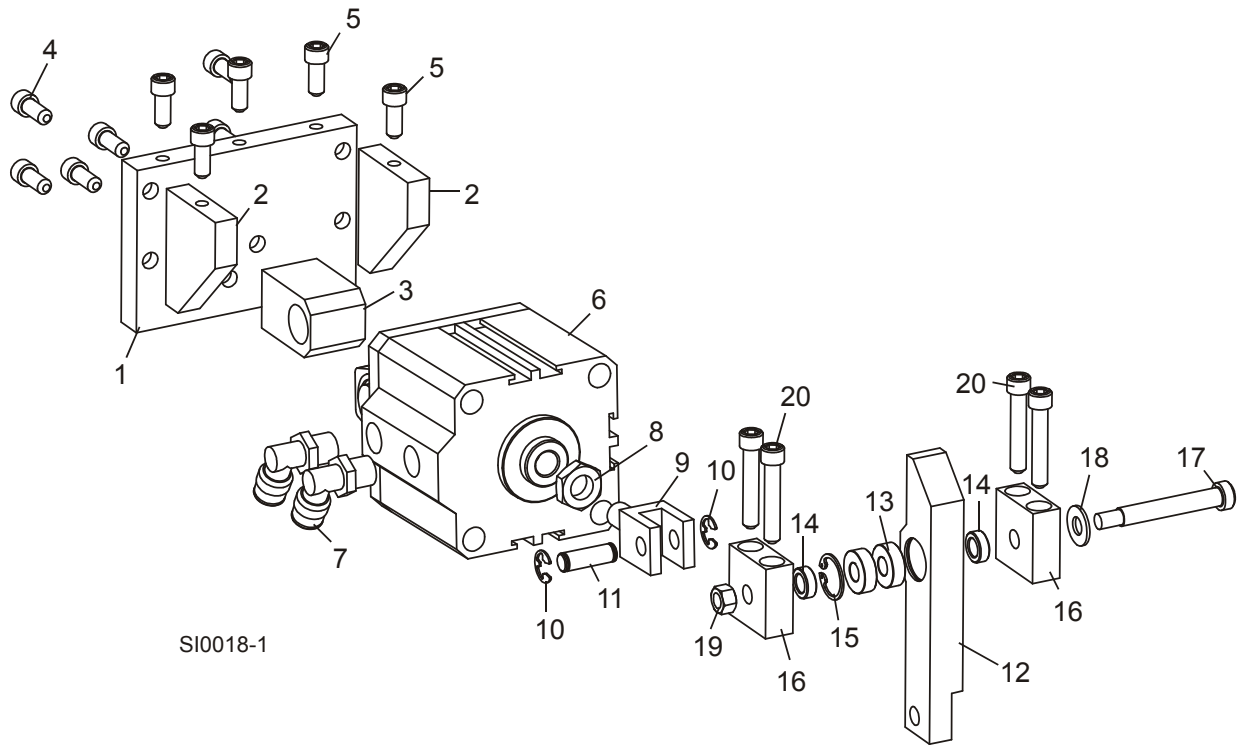


REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	CLAMP ASSEMBLY, SAS FRONT	035464	1	
1	Knob, Set Adjuster	035467	1	
2	Collar, 1-1/4 I.D. 2-Piece Clamping	035468	1	
3	Screw, 1/4-20 x 1/2" Socket Head Nylon Lock	F05005-55	1	
4	Holder, Push Pin	035465	1	
5	Screw, 1/4-20 x 3/8 SHCP Set	F05005-47	2	
6	Spring, .6 Dia Compression .510 Id x 3/4	032377	1	
7	Pin, Pusher (ReSharp)	032362-R	1	
8	Bracket, Pusher Pin Channel	032361	1	
9	Pin, Clamp	S32018	1	
10	Insert, 3/4" Carbide Clamping	P32010	1	
11	Bolt, #10-24 x 1/2" Flat Socket Head	F05004-61	1	
12	Clamp Wldmt, Front	032374	1	
13	Bushing, 5/16" ID x 1/2" OD x 1/2" Drill Jig	P32076	1	
14	Plate, Pusher Top SAS	035502	1	

15	Bolt, #8-32 x 3/8" Socket Head	F05004-85	4	
	Blowoff Assembly	032337	1	
16	Fitting, 1/8" NPT x 1/4" TB	P03078	1	
17	Blowoff, Air Assembly	032336	1	
18	Screw, 1/4-20 x 3/8" Half Dog Set	F05005-108	1	
19	Bolt, 5/16-18 x 1" Socket Head	F05006-19	4	
20	Gusset, Clamp Support	035461-1	1	
21	Gusset Weldment, Clamp Support w/Blow-off Bracket	035466	1	
22	Bolt, 5/16-18 x 1 1/2" Socket Head	F05006-66	2	
23	Bolt, 5/16-18 x 2 3/4" Socket Head	F05006-67	2	
24	Bolt, 5/16-18 x 3 1/4" Socket Head	F05006-59	4	
25	Plate, Lower Wear	032360	1	
	CLAMP ASSEMBLY, SAS BACK	035784	1	
26	Clamp Weldment, SAS Back	035787	1	
27	Bolt, 5/16-18 x 1" Socket Head	F05006-19	4	
28	Bolt, 5/16" x 7/8" Socket Head Shoulder	F05006-64	2	
29	Spring, .75" LTH Compression	P32011	2	
30	Nut, Hex 1/4-20 Lock	F05010-21	2	
31	Bolt, 5/16-18 x 3 1/4" Socket Head	F05006-59	4	
32	Gusset, Clamp Support	035461-1	2	
33	Bolt, 5/16-18 x 2 3/4" Socket Head	F05006-67	2	
34	Bolt, 5/16-18 x 1 1/2" Socket Head	F05006-66	2	
35	Guard, Top Sensor	035789	1	
36	Screw, #10-24 x 3/8" Socket Head	F05004-78	2	
37	Block, Sensor Mount	035791	1	
38	Bolt, #10-24 x 1" Socket Head	F05004-2	4	
39	Bolt, #10-24 x 1/2" Flat Socket Head	F05004-61	1	
40	Insert, 3/4" Carbide Clamping	P32010	1	
41	Bushing, 3/8" x 5/8" x 1 3/8" Drill	032352	1	
42	Pin Assembly, SAS Sensor	035783	1	
43	Plate, Sensor Detect	035792	1	
44	Screw, 10-24 x 3/8" Hex Head	F05004-150	2	
45	Washer, #10 Split Lock	F05011-20	2	
46	Spring, 3/4" x .36" I.D. Compression	035781	1	
47	Bracket Weldment, Air Cylinder	037988	1	
48	Bolt, #8-32 x 1/2" Socket Button Head Stainless Steel	F05004-64	4	
49	Washer, #8 Split Lock	F05011-79	4	
50	Plate, Blade Release	035462	1	
51	Clamp, 1/8" Wire 9/32" Mounting Hole	024148	1	
52	Cylinder, 1 1/16" Bore Air	P32055	1	
53	Nut, 5/16-24 Left-Hand Hex Jam	F05010-119	1	
54	Bolt, 5/16-24 x 1" Hex Head	F05006-11	1	
55	Screw, #6-32 x 1/2" Socket Head	F05004-23	4	

56	Fitting, 1/8” MPT x 1/4” Tube Swivel Elbow Air	P09736	2	
	Pin, .024” Dia. Gauge (Not Shown)	035730	1	
	Strip, .0700 Calibration (Not Shown)	032165	1	

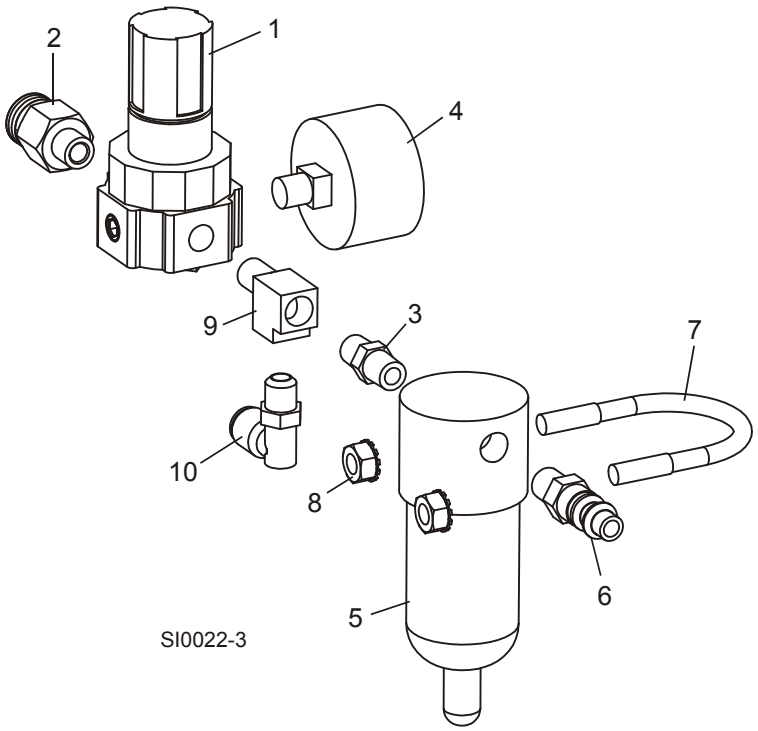
6.5 Cylinder Clamp Assembly



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	MOUNT ASSEMBLY, CYLINDER	A32080	1	
1	Plate, Pivot	S32078	1	
2	Gusset, Clamp Cylinder	S32079	2	
3	Block, Pivot	S32077	1	
4	Screw, 5/16-18 x 3/4" Socket Head	F05006-63	6	
5	**BOLT, 5/16-18 X 3/4" SOCKET HEAD**	F05006-63	5	
	CYLINDER ASSEMBLY, CLAMP	032919	1	
6	Cylinder, 3 1/4" Bore x 1/2" Stroke Air	P32034	1	
7	Fitting, 3/8" NPT X 3/8" 90° Air	P21526	2	
8	Nut, 1/2-13 Hex Jam	F05010-31	1	
9	Block, Clevis	S32081	1	
10	E-clip, 3/8" Shaft	P10689	2	
11	Pin, Clevis	S32083	1	
	ARM ASSEMBLY, CLAMP	A32031	1	
12	Arm, Clamp Pivot	S32029	1	
13	Bearing, R6-2 NSL SRI-2 ABEC-1	P10688	2	
14	Spacer, Bearing	S32032	2	
15	Ring, 7/8" Inside Retaining	F04254-23	1	
16	Block, Pivot	S32033	2	

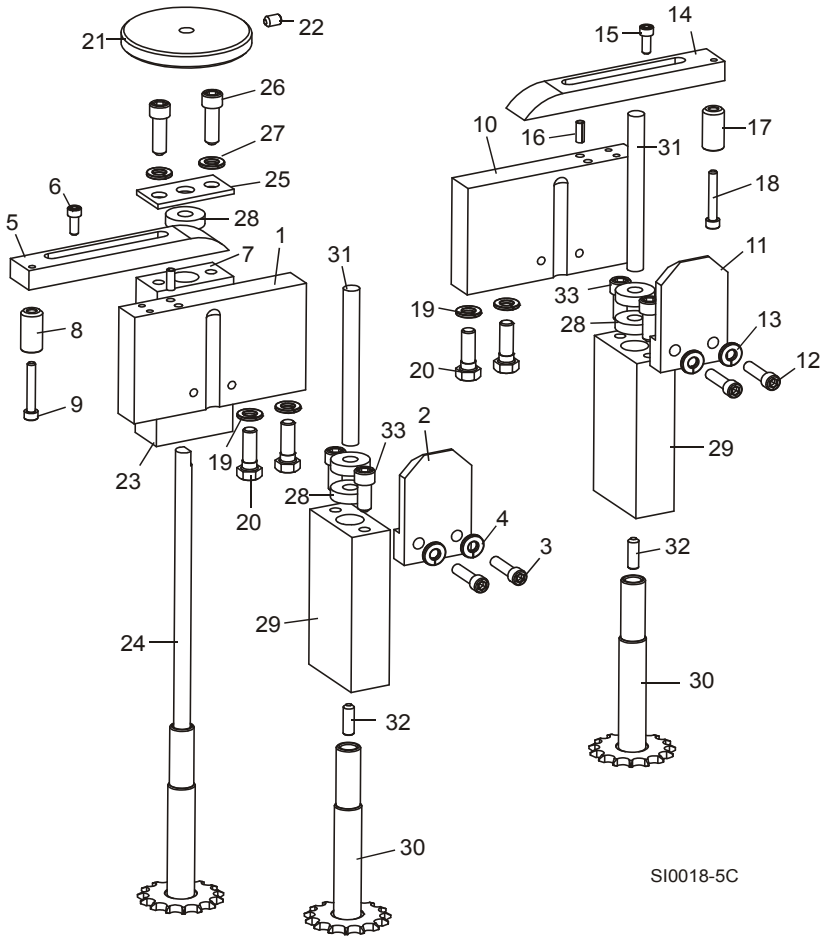
17	Bolt, 3/8” x 2 1/4” Shoulder (5/16-18 Thread)	F05006-116	1	
18	Washer, 3/8” Flat	F05011-3	1	
19	Nut, 5/16-18 Hex Lock	F05010-6	1	
20	**BOLT, 5/16-18 X 1 3/4” SOCKET HEAD**	F05006-65	4	

6.6 Air Regulator Assembly



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	Regulator Assembly, SAS Air	035524	1	
1	Regulator, R384-01C 300 PSI Air Flow	P02765	1	
2	Fitting, 1/8” NPT X 3/8” Tube Straight	P21553	1	
3	Fitting, 1/8” Dry Seal Nipple	P02764	1	
4	Gauge, 160 PSI	P02766	1	
5	Filter, #F504-01DH	P02769	1	
6	Fitting, 1/8” NPT Male Air Coupler	P22681	1	
7	Bolt, 1 9/16” I.D. ‘U’	S03062	1	
8	Nut, 1/4-20 Self-Locking Hex	F05010-9	2	
9	Fitting, 1/8” NPT Street ‘T’	032166	1	
10	Fitting, 1/8” MPT x 1/4” Tube Swivel Elbow Air	P09736	1	

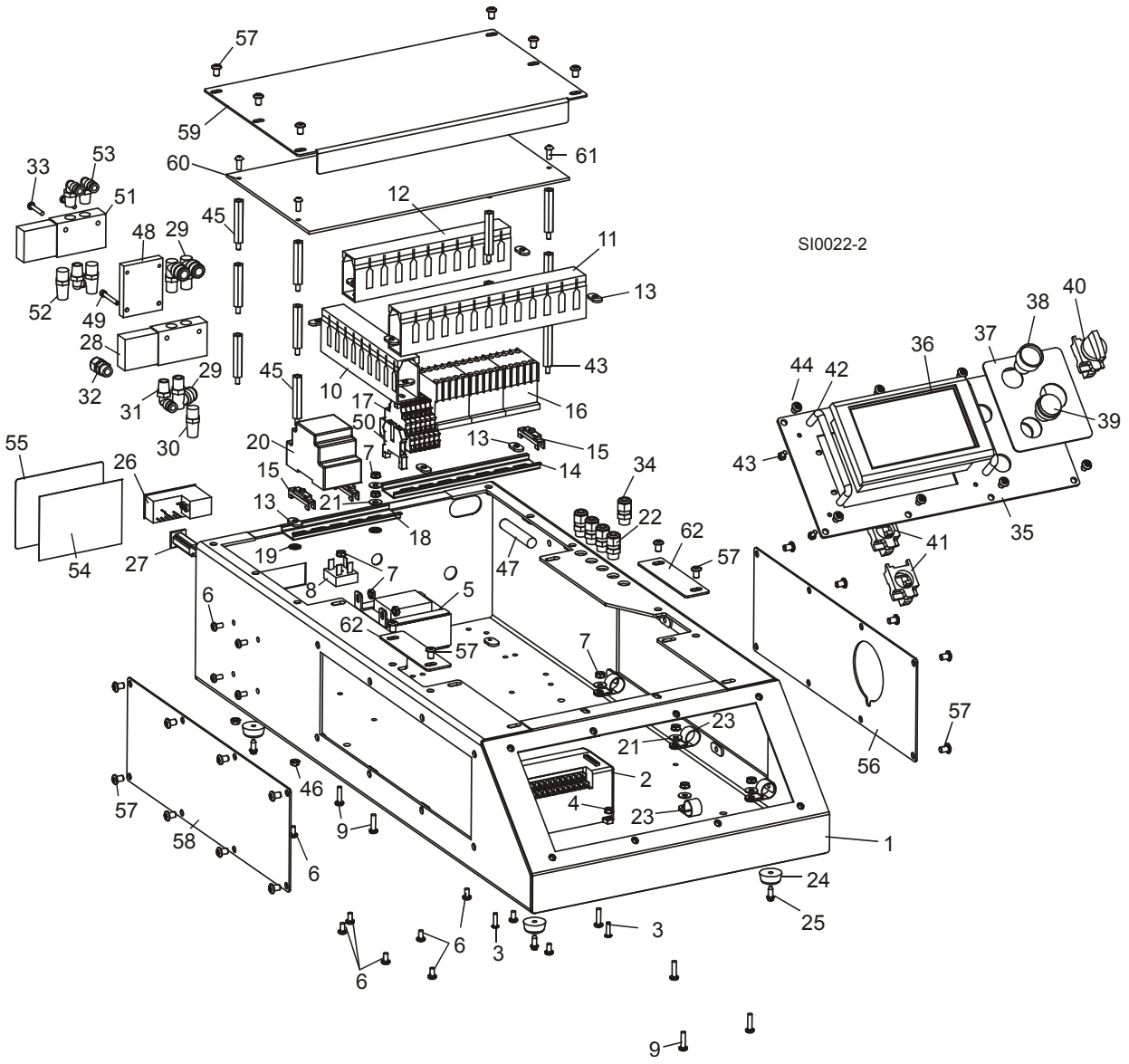
6.7 Rear Adjuster, Blade Height, Index Ramp Assemblies



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	BLOCK ASSEMBLY, SAS LEFT HAND INDEX	035501	1	
1	Block, SAS Index	035449	1	
2	Block, SAS Blade Guide	035454	1	
3	Bolt, 1/4-20 x 1” Socket Head	F05005-89	2	
4	Washer, 1/4” Split Lock	F05011-14	2	
5	Ramp, SAS Left Index	S32094	1	
6	Bolt, #10-24 x 1/2” Socket Head	F05004-26	1	
7	Pin, 3/16” x 1/2” Roll	F05012-35	1	
8	Pin, Blade Wear	S32105	1	
9	Bolt, #10-24 x 1 1/4” Socket Head	F05004-31	1	
	BLOCK ASSEMBLY, SAS RIGHT HAND INDEX	035500	1	
10	Block, SAS Index	035449	1	
11	Block, SAS Blade Guide	035454	1	
12	Bolt, 1/4-20 x 1” Socket Head	F05005-89	2	

13	Washer, 1/4” Split Lock	F05011-14	2	
14	Ramp, SAS Right Index	S32062	1	
15	Bolt, #10-24 x 1/2” Socket Head	F05004-26	1	
16	Pin, 3/16” x 1/2” Roll	F05012-35	1	
17	Pin, Blade Wear	S32105	1	
18	Bolt, #10-24 x 1 1/4” Socket Head	F05004-31	1	
19	**WASHER, 5/16” SPLIT LOCK**	F05011-13	4	
20	**BOLT, 5/16-18 X 1” HEX HEAD GRADE 2**	F05006-1	4	
	BLOCK ASSEMBLY, SAS REAR BLADE HEIGHT ADJUSTMENT	035528	1	
21	Knob, Blade Adjuster	032912	1	
22	Screw, 1/4-20 x 3/8” Socket Head Cup Point Set	F05005-47	1	
23	Block, Height Adjustment	S32099	1	
24	Adjuster Weldment, SAS Rear	035526	1	
25	**PLATE, WASHER RETAINER**	S32100	1	
26	**BOLT, 5/16-18 X 1” SOCKET HEAD**	F05006-19	2	
27	**WASHER, 5/16” SPLIT LOCK**	F05011-13	2	
28	**WASHER, 3/8” ID X 7/8” OD X 1/4” FELT**	P32102	6	
	BLOCK ASSEMBLY, BLADE HEIGHT ADJUSTMENT	A32103	2	
29	Block, Height Adjustment	S32099	1	
30	Idle Side Weldment	W32119	1	
31	Pin, 3/8 x 4 C2 Carbide Wear	P32104	1	
32	Screw, 1/4-20 x 3/4” Nylon Socket Head Cup Point Set	F05005-94	1	
33	**SCREW, 5/16-18 X 3/4” SOCKET HEAD**	F05006-63	4	
	CHAIN, #35 X 96 PITCH W/MASTER LINK (NOT SHOWN)	035519	1	

6.8 Control Base Assembly



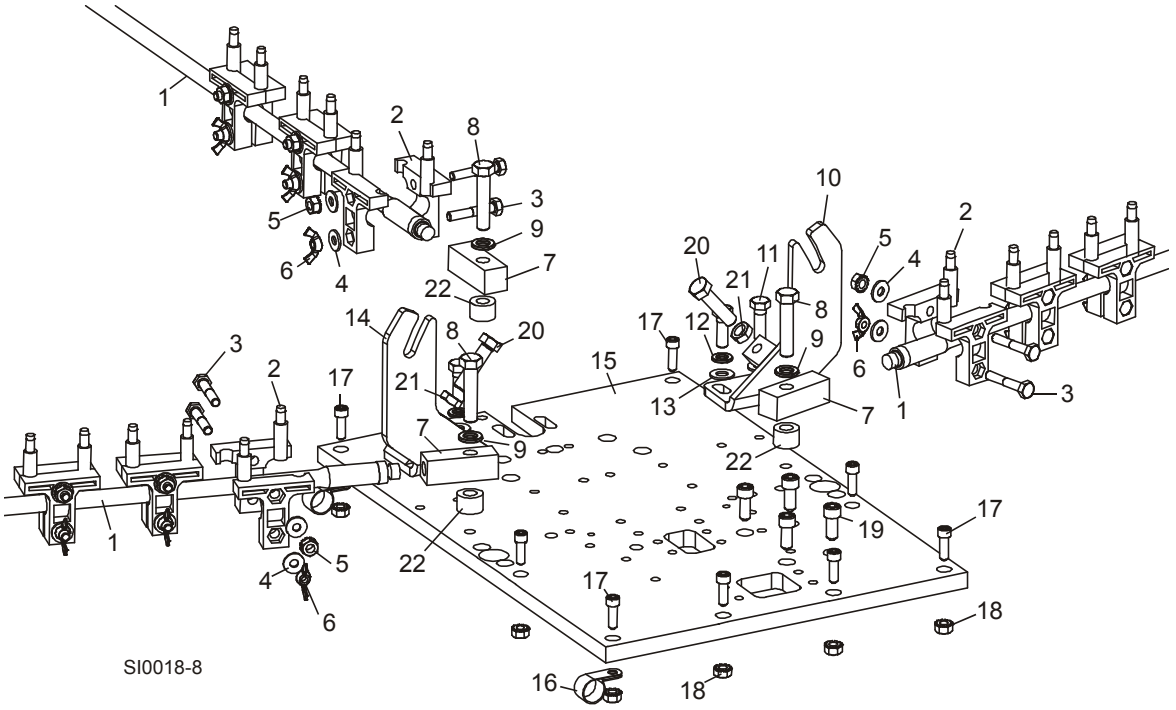
REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	BASE ASSEMBLY, SAS CONTROL	035514	1	
1	Box Weldment, SAS Control	035510	1	
2	PLC Assembly, SAS	050060	1	
3	Bolt, #8-32 x 5/8" Socket Button Head Stainless Steel	F05004-98	2	
4	Nut, #8-32 Self-Locking	F05010-41	2	
5	Transformer Assembly, 115/230 Pri 12/24 Sec	050086	1	
6	Bolt, #10-24 x 3/8 CrSI PH	F05004-3	13	

7	Nut, #10-24 Self-Locking	F05010-14	11	
8	Rectifier, Bridge, 50 Peak Inv.	E10456	1	
9	Bolt, #10-24 x 3/4" Phillips Pan Head	F05004-126	6	
10	Cable Duct, 2" H x 1" W x 7" L Open Slot Gray	024472-7	1	
11	Cable Duct, 2" H x 1" W x 9 1/2" L Open Slot Gray	024472-9_50	1	
12	Cable Duct, 2" H x 1" W x 8" L Open Slot Gray	024472-8	1	
13	Nut, #10-24 Weld	F05010-78	9	
14	Rail, 35mm x 7.5mm x 7 1/2" Steel DIN	024474-7_5	1	
15	Clamp, Metal DIN Rail	E22707	3	
16	Contactor, 2NC 2NO 9A 24VDC Reversing	024910	3	
17	Terminal Block, 3-Tier	024908	6	
18	Rail, 35mm x 7.5mm x 5 1/2" Steel DIN	024474-5_5	1	
19	Washer, 1/4" Interior Star Lock	F05011-69	2	
20	Power Supply Assy, 24VDC 1.0A Switcher	050085	1	
21	Washer, #10 SAE Flat	F05011-18	6	
22	Connector, .5 Hole .064-.210 Cord	E23494	4	
23	Clamp, 5/8" EMT Coated	010748	4	
24	Foot, Rubber	P06104	4	
25	Bolt, #8-32 x 1/2 S1 Hex Head	F05015-18	4	
26	Module Assy, Power Entry	050073	1	
27	Breaker, 3 Amp Panel Mount	E10466	1	
	Valve Assy, SAS Air	035517	1	
28	Valve, 4 Way 24V Air Solenoid	035516	1	
29	Fitting, 1/4" NPT x 3/8" 90° Air	P21521	2	
30	Muffler, 1/4" NPT Air	P20904	1	
31	Fitting, 1/4 Npt X 1/4 Air 90 Deg.	P21519	1	
32	Connector, .5 Hole .064-.210 Cord	E23494	1	
33	Screw, #8-32 x 1 S1 Machine Brass	F05004-34	2	
	Cable, 8mm x 2m 90° Prox	050063	4	
	Harness Assembly, SAS Index Motor	050221	1	
34	Connector, .5 Hole .064-.210 Cord	E23494	1	
	Harness Assembly, SAS Cam Motor	050222	1	
	Panel Assembly, SAS Control	050075	1	
35	Panel, Front Control Box	035515	1	
36	Display Assembly, SAS OP-620	050127	1	
	Cable, OP-620 Display	050125	1	
	Label Set, SAS Operator Display	054996	1	
37	Decal, SAS Control Panel	035778	1	
38	Switch Head, Green Guarded	050152	1	
39	Switch Head, Red Extended	050151	1	
40	Switch, 2 Pos 1 NO Contact Toggle	050150	1	
41	Switch Body, 22mm 1 NO 24 XB4	025242	2	
42	Handle, Door	P08065	2	

43	Screw, #8-32 x 3/8” Self-Tapping	F05015-8	4	
44	Bolt, 1/4-20 X 3/8” Socket Button Head	F05005-62	8	
45	Standoff, 1/4” Hex #8-32 Male/Female	035775	12	
46	Nut, #8-32 Self Locking	F05010-41	4	
	Power Cord, 125V 10A 3 Conductor 6’ 7” (Not Shown)	050592	1	
47	Prox Sensor, 12mm Ultra Linear W/C	050069-1 [1]	1	
	Sensor, 12mm Linear Prox	050069	1	
48	Bracket, Air Solenoid	037986	1	
49	Screw, #-32 x 1 1/4” Socket Head	F05004-225	2	
50	Terminal Block 1-Tier Phoenix	024893	1	
	Valve Assy, SAS Air	037985	1	
51	Valve, 4 Way 24V Air Solenoid	035516	1	
52	Muffler, 1/4” NPT Air	P20904	2	
53	Fitting, 1/4 Npt X 1/4 Air 90 Deg.	P21519	3	
54	**DECAL, SAS SERIAL PLATE**	035529	1	
55	**DECAL, SERIAL PLATE OVERLAY**	035532	1	
56	**PANEL, CONTROL BOX SERVICE RIGHT SIDE**	035512	1	
57	**BOLT, 1/4-20 X 3/8” SOCKET BUTTON HEAD**	F05005-62	26	
58	**PANEL, CONTROL BOX SERVICE LEFT SIDE**	035513	1	
59	**PANEL, CONTROL BOX TOP SERVICE**	035508	1	
60	**PLATE, SAFETY**	035776	1	
61	**BOLT, #8-32 X 1/2” PHILLIPS HEAD**	F05004-52	4	
62	**PLATE, TOP COVER**	035780	2	

[1] Changed Senor after 10/14/2021 per ECN38177

6.9 Blade Support Arms



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	ARM ASSEMBLY, BLADE SUPPORT	060031	3	
1	Tube Assy, Blade Support	A04550	1	
	Extension Assembly, 24" Blade Arm	060035	1	
	Guide Assembly, Blade Support	A30008	3	
2	Guide, Blade Support W/ Post	S10611	2	
3	Bolt, 1/4-20 x 1 1/2” Hex Head	F05005-5	2	
4	Washer, 1/4” SAE Flat	F05011-11	2	
5	Nut, 1/4-20 Self-Locking Hex	F05010-9	1	
6	Nut, 1/4-20 Wing	F05010-13	1	
7	**BLOCK, SAS BLADE SUPPORT ARM MOUNTING**	035777	3	
8	**BOLT, 3/8-16 X 1 3/4” HEX HEAD FULL THREAD**	F05007-19	3	
9	**WASHER, 3/8” SPLIT**	F05011-4	3	
10	**STOP PLATE WELDMENT, INDEX RIGHT HAND**	035494	1	
11	**BOLT, 5/16-18 X 3/4” HEX HEAD**	F05006-5	4	
12	**WASHER, 5/16” SPLIT LOCK**	F05011-13	4	
13	**WASHER, 5/16” SAE FLAT**	F05011-17	4	
14	**PLATE WELDMENT, INDEX LEFT HAND STOP**	035497	1	
15	**PLATE, SAS BASE**	035451	1	
16	**CLAMP, 1/2” EMT COATED**	010748	2	
17	**SCREW, 1/4-20 X 3/4” SOCKET HEAD**	F05005-26	8	

18	**NUT, 1/4-20 SELF-LOCKING HEX**	F05010-9	8	
19	**SCREW, 5/16-18 X 3/4" SOCKET HEAD**	F05006-63	4	
20	**BOLT, 3/8-16 X 1 1/2" HEX HEAD**	F05007-17	2	
21	**NUT, 3/8-16 HEX JAM**	F05010-29	2	
22	**SPACER, 25/64" I.D. X 3/4" O.D. X 1/2" LONG**	S22625	3	

SECTION 7 ELECTRICAL INFORMATION

7.1 Electrical Symbol Diagram

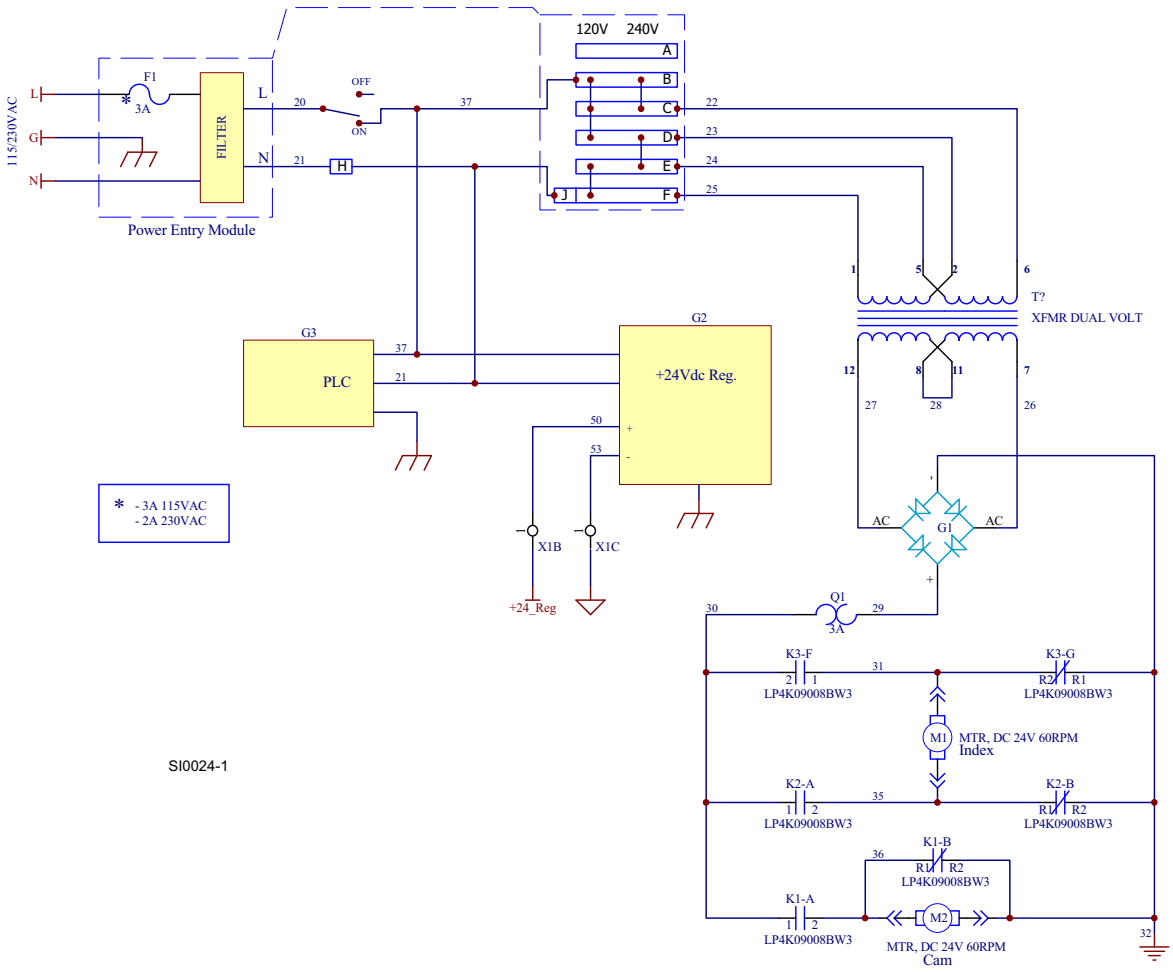


FIG. 7-1 PAGE 1 OF 3

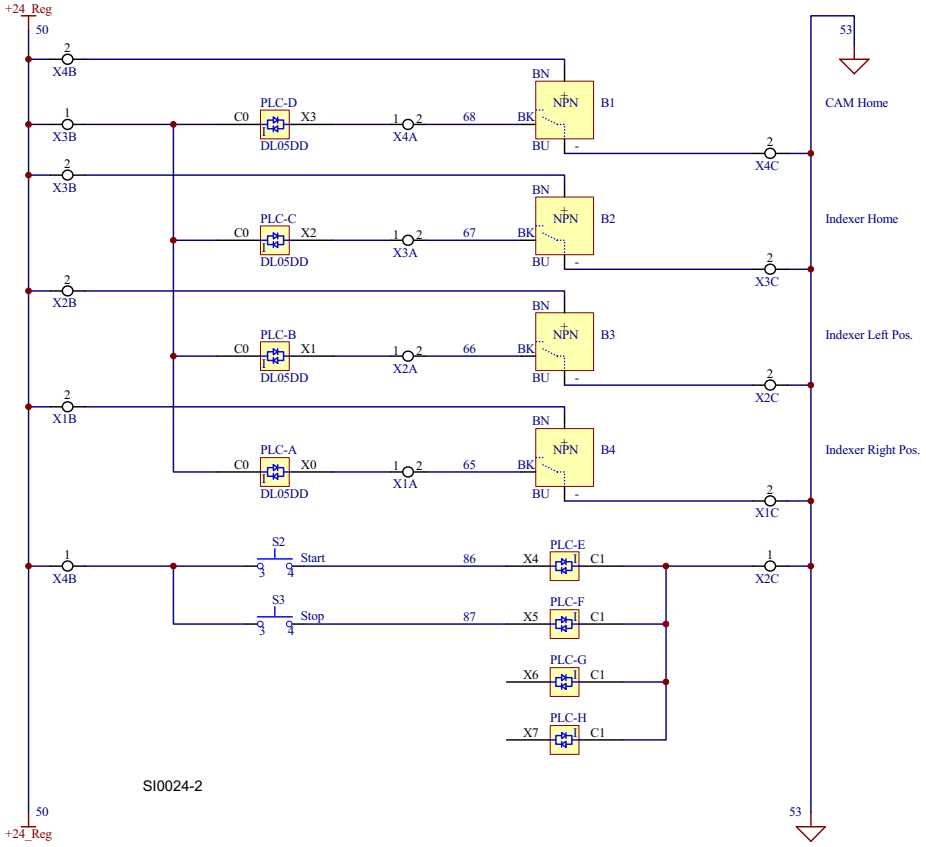


FIG. 7-2 PAGE 2 OF 3

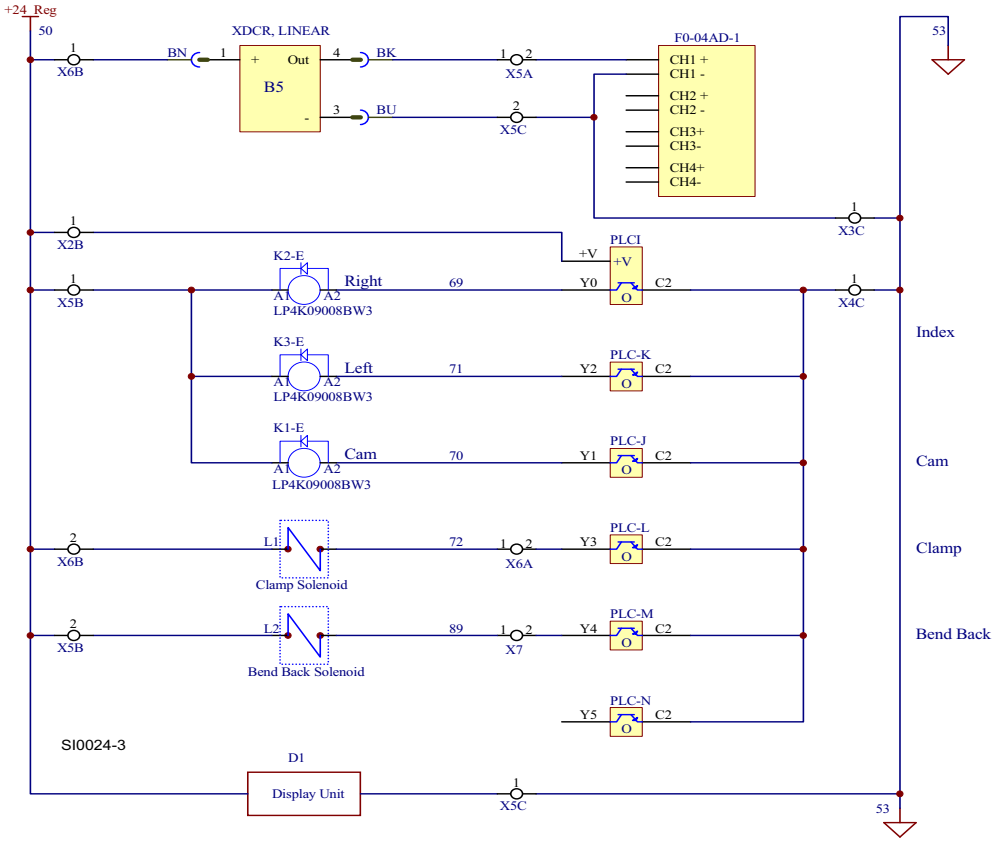


FIG. 7-3 PAGE 3 OF 3

INDEX