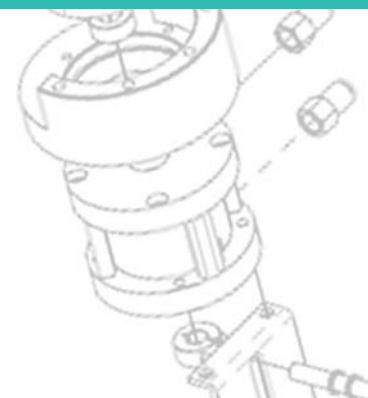
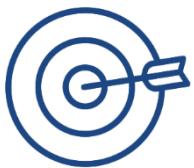




*Machine Setup  
and Usage  
Workbook*

**WORKBOOK**



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# INTRODUCTION

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**HOW TO USE THIS WORKBOOK:** This workbook is designed as an aid for you to use after you've participated in the 3D AccuForm Synchro Training Course. After partaking in the training course, this workbook will guide you through the steps you need to take to set up your own 3D AccuForm Synchro machine for use.



## Goals

Upon completion of this course, you will be able to:

- ① Set up your own 3D AccuForm Machine and have it ready for use to bend wire to your specifications.



## Tip

*This icon will be used throughout the workbook to give additional information.*



## Caution

*This icon will be used throughout the workbook as a symbol to use caution when performing an action.*



## Note

*This icon will be used throughout the workbook as a section for you to jot down notes to assist you with setting up your 3D AccuForm Machine.*

# MACHINE SETUP AND USAGE

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## Workbook Snapshot

In the past several modules, we covered the Machine Setup and Usage process for the 3D AccuForm Synchro Machine. An overview of the payoff unit setup was also provided along with step-by-step video instructions that walk through the payoff setup process. The process steps covered in these modules were:

1. Setup Payoff
2. Set Reference Rollers
3. Setup Feeder
4. Calibrate Feed Rollers and Slip Detection
5. Setup Arm Wire Guide/Cutter
6. Setup Bender Assembly
7. Straighten Wire

It's now time to practice these steps on your own machine.

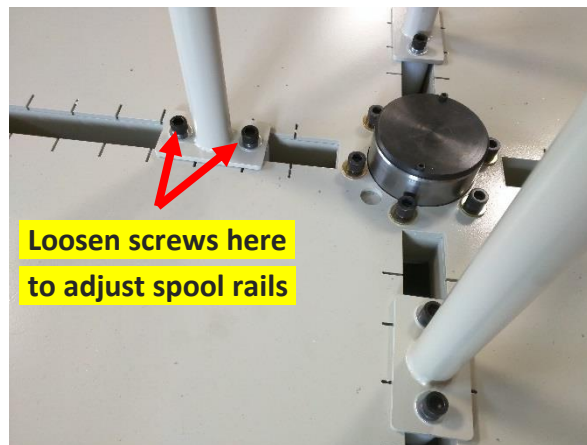


## Setup Payoff Action Items

The following steps describe how to setup the payoff. Review the steps, then complete the activity at the end of this section.

### Action 1: Adjust the Spool Rails

The first adjustment that should be made involves the spool rails in the center of the turntable. These rails should be set close to the inside opening of the coil on the carrier, but not so close that it impedes the coil and carrier from lowering easily over the top.



1. To adjust the spool rails, loosen the two bolts clamping the rail to the slot in the turntable.



### Caution

*Make sure not to unscrew the bolts all the way. Doing so could cause the lower part of the bracket to fall beneath the turntable.*



### Tip

*When loosened, slide the rail into position, and retighten the bracket. Adjust the rails so that they are evenly distributed from the center of the turntable. This ensures that the wire coil will sit in the middle of the table.*

## Action 2: Remove/Install the Outrigger Arms

The next step is to remove the outrigger arms. These are the removable posts on both sides of the payoff that hold the guide rollers and align the path of the wire.



1. To remove the outrigger arm, locate the two pins at the base of the arm and pull them out, then remove the arm from the machine.
2. Once the arm is removed, you can load the wire onto the payoff. You will need to follow your company policy for loading the wire carrier onto the turntable.
3. When complete, replace the outrigger arms by aligning the holes with those in the bracket and reinstall the pins.

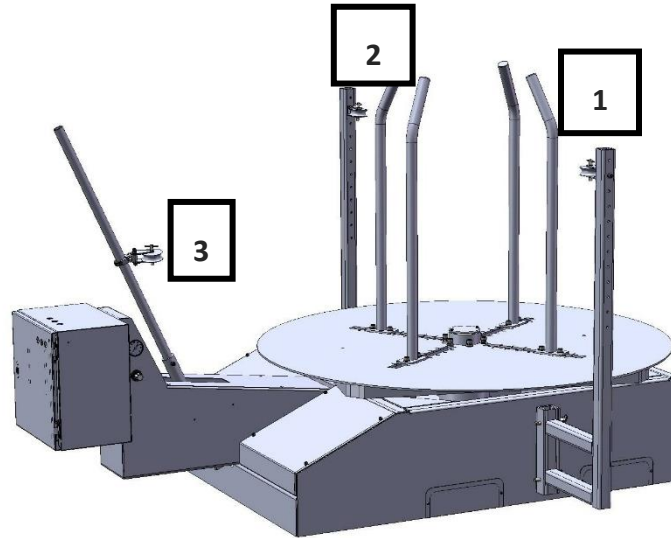


### Caution

*Use care when handling the removal and installation of the outrigger arms to ensure that they do not fall freely. To avoid injury, this task is best completed with a partner.*

### Action 3: Adjust the Height of the Guide Rollers

There are three guide rollers around the payoff unit: one on each outrigger arm and one on the dancer arm. The guide rollers should be adjusted so that the wire will follow a gentle curve around the payoff, exiting into the opening of the straightener.

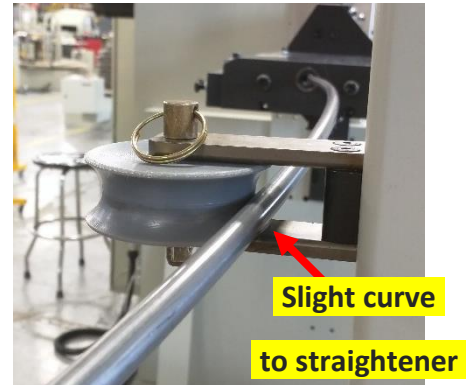
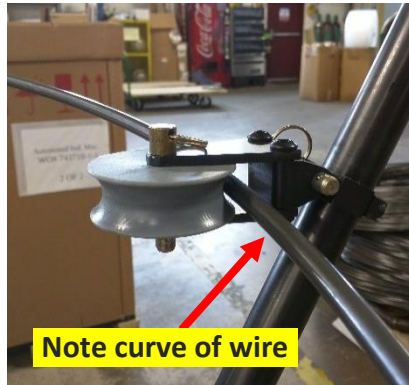


1. To adjust the height of the guide rollers, set the height of roller 2 to the height of the wire coil.
2. Set the height of roller 1 to be directly in line with the straightener.
3. Set the height of roller 3 at approximately half the height of rollers 1 and 2.



### Action 4: Thread Wire Through the Machine

Once you adjust the height of the guide rollers, you're ready to thread the wire through the machine.



1. To do this, first unhook the coil end from the wire carrier.
2. Cut off the bent or deformed wire from the end of the coil.
3. Thread the wire through the guide rollers starting with roller 2, then roller 3 and finally through roller 1.
4. Insert the wire end into the straightener and use the straightener rollers to hold wire in place.



## Caution

*Pulling the wire off the coil at excessive angles can force unnecessary over-adjustment in other setup areas. This can lead to damage of the payoff, wire, and inconsistencies in straightness and part repeatability.*

## Action 5: Set Operation Mode

The next adjustment on the payoff is to set the operation mode. The toggle switch to control this functionality is located in the operator controls area at the top of the control center cabinet.

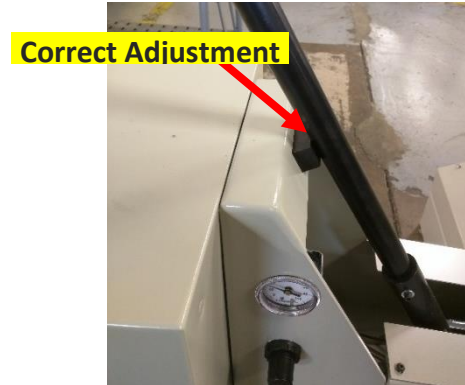


You have three operation modes to choose from; Manual, Auto and Reverse.

Manual	This option powers on the payoff or turntable. When the dancer arm is pulled forward, the payoff will rotate counter-clockwise and feed the wire coil to the machine. Primarily used for the initial setup of the machine.
Auto	This option also powers on the payoff. The payoff will remain on unless the machine is in a faulted state. If this occurs, errors must be cleared to regain normal function. Primarily used for running production on the machine.
Reverse	This option activates the blue status light and the button located on the control cabinet marked Reverse. When pressed, the reverse button will feed wire clockwise or backwards. Typically used when unloading wire from the machine during wire change over.

### Action 6: Adjust the Dancer Arm Pressure

Now that the wire has been loaded, you are ready to adjust the resistance of the dancer arm. The amount of force required to pull the dancer arm forward is controlled by the regulation of air pressure to the cylinder.



The pressure required depends on the type and size of material installed. Pressure should be adjusted low enough so that as the wire tightens against the coil, the arm can move forward and start the rotation of the table.

1. To adjust the dancer arm, locate the operator controls, where the dancer arm connects to the cylinder, inside the frame.
2. Use the knob and gauge to adjust the pressure. Starting at a low pressure, turn the knob until slack is produced in the coil and the dancer arm rests against the back bumper.

The dancer arm should align closely to the machine, when adjusted incorrectly, you will see a gap of space between the frame of the machine and the dancer arm.



## Caution

*If the pressure is set too high, it will become too difficult for the feeder system to pull forward on the arm. This can potentially lead to damage to the wire, inconsistency in part formation, and/or repeated faulting of the machine.*



## Note

*As parts are generated, the slack of wire between the payoff unit and the machine tightens.*

*This then pulls the dancer arm forward. When the dancer arm is moved away from the resting position, the turntable will start to rotate. The further the dancer arm is pulled forward, the faster the turntable will spin.*



## Setup Payoff Activity

Use your own 3D AccuForm Machine, and the steps previously covered in this workbook to set up the Payoff.

- Action 1:** Adjust the Spool Rails
- Action 2:** Remove/Install the Outrigger Arms
- Action 3:** Adjust the Height of the Guide Rollers
- Action 4:** Set the Machine Operation Mode
- Action 5:** Thread Wire Through the Machine
- Action 6:** Adjust the Dancer Arm Pressure

**Note any questions you have as you perform the setup, then review the online modules to address your questions.**

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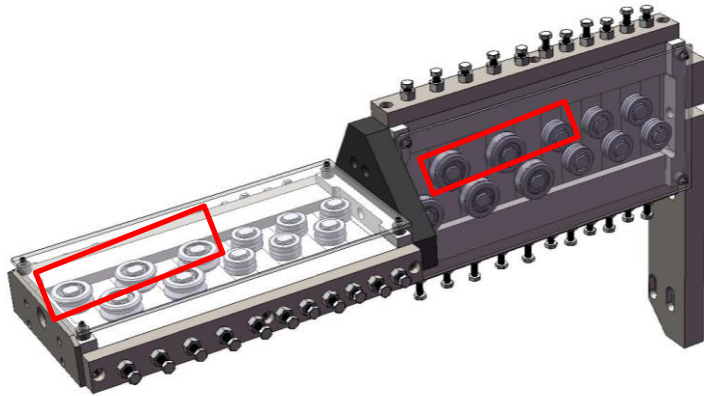


## Set Reference Rollers

The following steps describe how to set the reference rollers. Review the steps, then complete the activity at the end of this section.

### **Action 1: Identify straightener, roller type and wire diameter**

There are three reference rollers on both the horizontal and vertical straightener planes.



1. To set the reference rollers, first identify the straightener, roller type and wire diameter.

**Action 2: Identify dimension to set the roller**

1. To locate the correct dimension, go to the S8 or S12 straightener chart and find the dimension for your wire diameter.

<b>S8 Straightener</b>			
S8 Rollers		S4 Rollers	
Wire Diameter	(X) Dimension	Wire Diameter	(X) Dimension
8.0mm (.315")	2.25mm	4.0mm (.157")	19.0mm
7.0mm (.276")	2.75mm	3.0mm (.118")	19.5mm
6.0mm (.236")	3.25mm	2.0mm (.079")	20.0mm
5.0mm (.197")	3.75mm	****	****
4.0mm (.157")	4.25mm	****	****
3.0mm (.118")	4.75mm	****	****

<b>S12 Straightener</b>					
S12 Rollers			S8 Rollers		
Wire Diameter	(X) Dimension	(X) Dimension	Wire Diameter	(X) Dimension	(X) Dimension
12.0mm (.472")	8.5mm	8.5mm	8.0mm (.315")	23.2mm	23.2mm
11.0mm (.433")	9.0mm	9.0mm	7.0mm (.276")	23.7mm	23.7mm
10.0mm (.394")	9.5mm	9.5mm	6.0mm (.236")	24.2mm	24.2mm
9.0mm (.354")	10mm	10mm	5.0mm (.197")	24.7mm	24.7mm
8.0mm (.315")	10.5mm	10.5mm	4.0mm (.157")	25.2mm	25.2mm
7.0mm (.276")	11mm	11mm	****	****	****



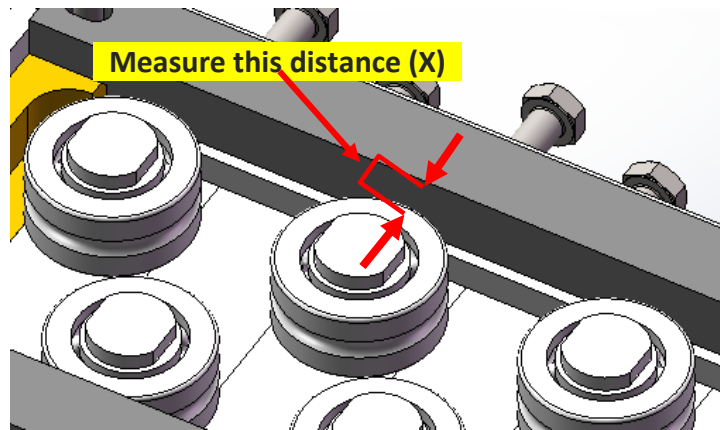
## Note

*The fixed dimensions will change based on the wire diameter, so be sure to review the appropriate straightener chart and wire diameter to determine your dimension.*



### Action 3: Set Rollers to the Dimension

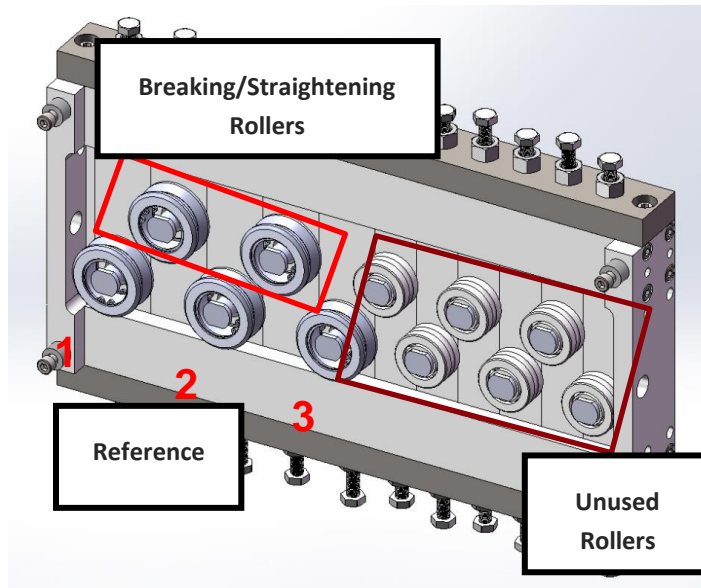
You will then need to measure the dimension found in the Straightener Chart from the wall of the straightener frame to the flat edge on the outer diameter of the roller.



1. Use the bolts on the side to adjust the three reference rollers to the dimension on the horizontal plane.
1. Move to the vertical plane and make the same adjustment for those three reference rollers.

#### Action 4: Move Unused Rollers Back

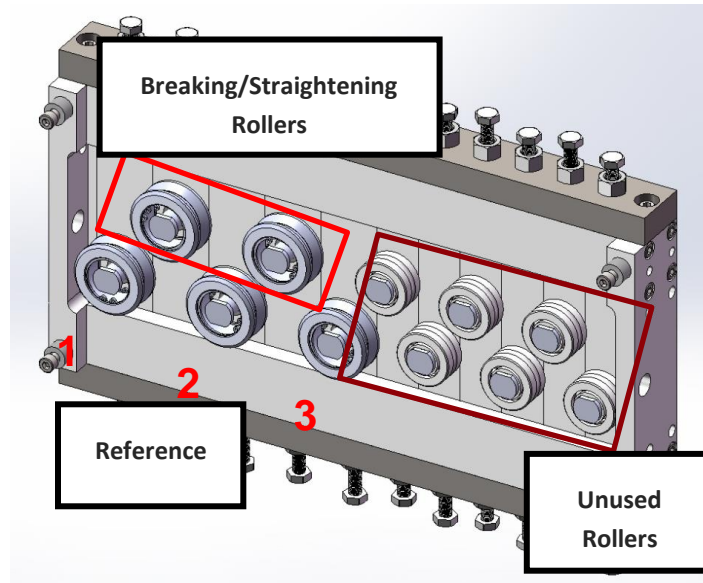
Once all the reference rollers on both the horizontal and vertical planes have been adjusted, you will need to move any rollers that are not used back and completely away from the wire path.



1. Use the bolts on the side of the straightener to move the rollers back.

## Action 5: Thread the Wire Through the Straightener

The last step in this process is to thread the wire through the straightener.



1. To do this, loosen the breaking and straightening rollers on both the horizontal and vertical straightener planes. These are the two rollers opposite the three reference rollers.
2. If the wire is deformed, cut off any deformations.
3. Straighten the wire slightly, this can be done with the use of a wrench or the payoff rollers.
4. Manually push the wire through the straightener. If you are using a larger size wire, you may require a partner.
5. Open the feed rollers, then push the wire past the feed rollers, through the encoder, and then into the wire guide tube.
6. Close the feed rollers to hold the wire in place.



### Caution

*Be careful as you manually push the wire through straightener. It is best go slowly.*



## Set Reference Rollers Activity

Use your own 3D AccuForm Machine, and the steps previously covered in this workbook to set your reference rollers.

**Action 1:** Identify straightener, roller type and wire diameter

**Action 2:** Identify dimension to set the roller

**Action 3:** Set rollers to the dimension

**Action 4:** Move unused rollers back

**Action 5:** Thread the wires through the straightener

**Note any questions you have as you perform the setup, then review the online modules to address your questions.**

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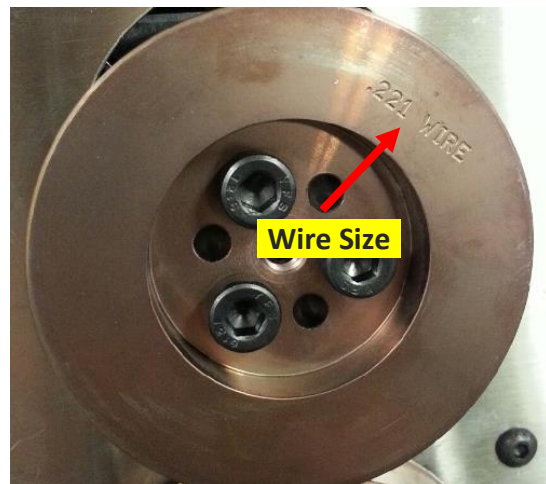


## Setup Feeder

The following steps describe how to setup the feeder. Review the steps, then complete the activity at the end of the section.

### Action 1: Install the Feed Rollers

The first step is to install the feed rollers. When installing the feeder rollers, the most important consideration must be the size of the groove that will be in contact with the wire. The value that is stamped on the front of the roller is the size of the groove that the wire will sit in.



1. To install the feed rollers, line up the hole pattern on the feeder roller with the bolt pattern on the feeder shaft. Slip the feeder roller on to the shaft, then install and tighten the screws.
2. Repeat these steps for the next three feed rollers.

## Action 2: Install Upper Encoder Roller

The next step is to install the encoder roller.

The machine will come with three different encoder wheels based on the machine wire capacity; 4 mm, 6 mm and 12 mm. For machines with capacity larger than 12mm, the 16 mm encoder roller is used.

1. The encoder wheel is installed simply by slipping it onto the shaft, above the encoder.

### Encoders

- ENC-08-1C-V4 (.080" - .156") – 4mm
- ENC-08-2C-V4 (.187" - .250") – 6mm
- ENC-08-3C-V4 (.250" - .500") – 12mm
- ENC-08-1-V5 (.500" - .625") – 16MM



## Caution

*Remember to install the correct encoder roller for the wire size being used. Using an incorrect encoder roller can cause inconsistencies in feed lengths, faulting of the machine, and prevent the wire from feeding.*

### Action 3: Install Guide Block

The next step is to install the guide block. Remember, this is an optional installation for wire diameters that are 5mm or less.



1. To install the guide block, line up the holes on the guide block to the feed unit holes and mount the guide block using the four screws.



### Caution

*The screws should be loosely tightened. Final tightening should be made after the wire is installed on the machine and the guide is centered.*

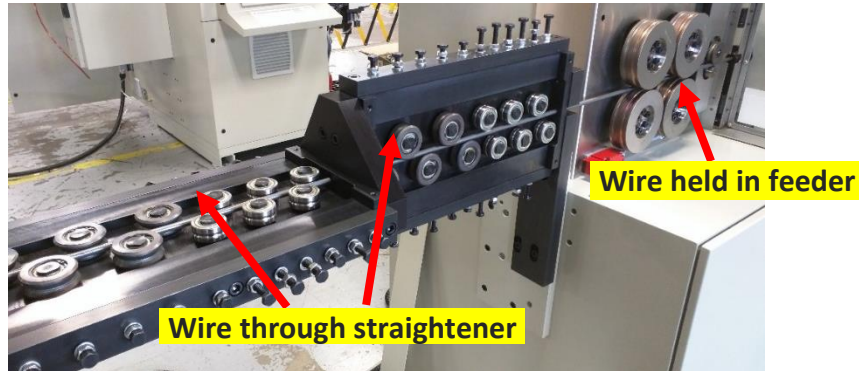


### Tip

*With the machine disabled, you can use your foot to push the turntable and rotate the coil. This can be a helpful technique to get enough slack in the coil to be able to thread the wire around the payoff and through the machine.*

**Action 4: Install Wire through Feeder**

You are now ready to insert the wire through the feeder.



1. With the wire through the straightener, open the feeder unit and thread the wire into the feeder rollers and past the encoder section on the feeder unit and into the guide tube.
2. Toggle the feed rollers switch to close the feed and encoder rollers.



## Caution

*It is important to make sure that the end of the wire is passed the encoder and inside guide tube. This allows the machine to jog wire forward without faulting or hitting any parts of machine.*



### Action 5: Adjust Air Pressure

The last step is to adjust the air pressure for the feeder or encoder. The Feeder/Encoder Pressure Recommendation chart can be used to identify the recommended pressure for specific wire diameters.



1. To set the Feeder Roller pressure, look at the recommended air pressure table, find the pressure value needed for your feeder using the Feeder/Encoder Pressure Recommendation chart.
2. Find the feeder rollers pressure dial and gauge, rotate the dial until the gauge is set to the PSI found in the chart.
3. If lowering the air pressure, lower the air pressure almost to zero and wait for the cylinder to empty. Then increase the air pressure to the necessary set point. This will ensure that the air pressure in the cylinder is adjusted properly.



#### Tip

*It may be necessary to open and close the feeder between air pressure adjustments.*

Recommended Air Pressures					
S.A.E.			METRIC		
Wire Dia.	Feeder	Encoder	Wire Dia.	Feeder	Encoder
inch	psi	psi	mm	bar	bar
0.125"	20	20	3,2	1.38	1.38
0.188"	50	40	4,7	3.45	2.76
0.250"	70	50	6,3	4.83	3.45
0.312"	80	60	8,0	5.52	4.14
0.375"	100	60	10	6.89	4.14
0.472"	120	60	12	8.27	4.14



## Setup Feeder Activity 3

Use your AccuForm 3D Machine and the steps covered to set up the feeder. For more detailed steps, refer back to the Setup Feeder module.

**Action 1:** Install Feed Rollers

**Action 2:** Install Upper Encoder Roller

**Action 3:** Install Guide Block

**Action 4:** Insert Wire through Feeder

**Action 5:** Adjust Air Pressure for Feeder/Encoder

**Note any questions you have as you perform the setup, then review the online modules to address your questions.**

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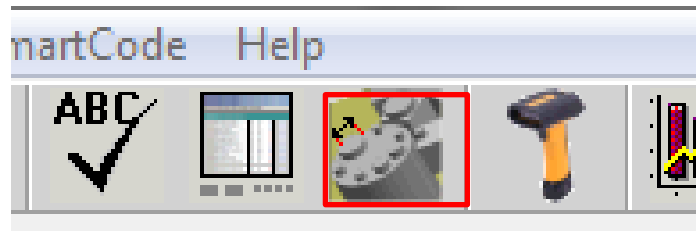


## Calibrate Feed Rollers and Slip Detection

The following steps describe how to calibrate the feed rollers and slip detection. Review the steps, then complete the activity at the end of the section.

### Action 1: Set the Correct Wire Diameter

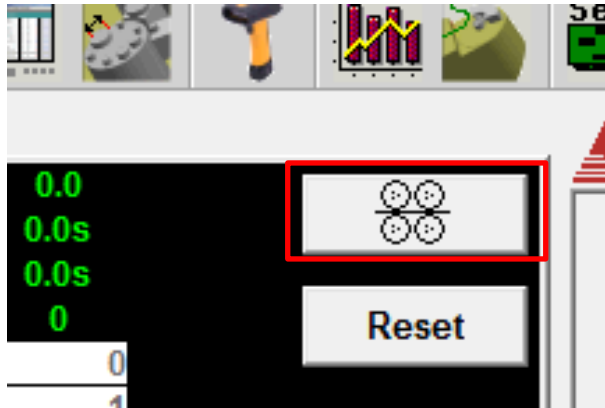
Before calibrating, you will need to set the correct wire diameter in the tool file.



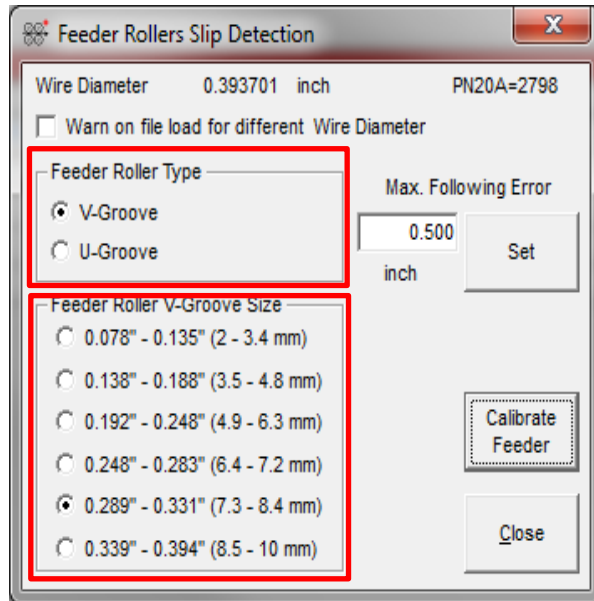
1. To do this, go to the SmartEditor® application found in the control center.
2. From the Tool Bar, click the **Tool Geometry** icon or press the F5 key.
3. From the SmartEditor® Tool Definition window, select the **Material** tab.
4. Enter the correct diameter for the wire in the **Wire Diameter** field, then click “OK” to close the window. The wire diameter is now set.

## Action 2: Calibrate the Feed Rollers Slip Detection

Feed Roller Icon



Feed Roller Slip Detection Window



1. To activate the feed rollers' slip detection, click the **Select Feed Rollers** icon.
2. Select the **feeder roller type** used on the machine. This option will automatically default to V-Grove.
3. If using V-Grove rollers, select the V-Grove size.
4. Enter the Max. Following Error. This option is used to set the sensitivity of the Slip Detection. We recommend setting the value to 0.500 to start with.
5. Once the Max. Following Error is entered, click the **Set** button.
6. Click the **Calibrate Feeder** button and click **Close**.



## Caution

*A higher Max. Following Error value may be necessary depending on the form generated, especially during radius generation.*

*Be aware that setting the Max. Following Error above factory settings can increase risk of component damage. This value directly controls the amount of*

*distance the rollers will be allowed to slip on the wire before faulting. Exercise extreme caution if adjusting this value!*



## Calibrate Feed Rollers and Set Slip Detection Activity

Using the SmartEditor® Application connected to your AccuForm 3D Machine, calibrate the feed rollers and set the slip detection. Follow the steps below. For more detailed steps, refer back to the Calibrate Feed Rollers and Set Slip Detection Module.

**Action 1:** Set the Correct Wire diameter

**Action 2:** Calibrate the Feed Rollers and set Slip Detection

**Note any questions you have as you perform the setup, then review the online modules to address your questions.**

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## Setup Arm Wire Guide/Cutter Assembly

The following steps describe how to setup the arm wire guide and cutter assembly. Review the steps, then complete the activity at the end of the section.

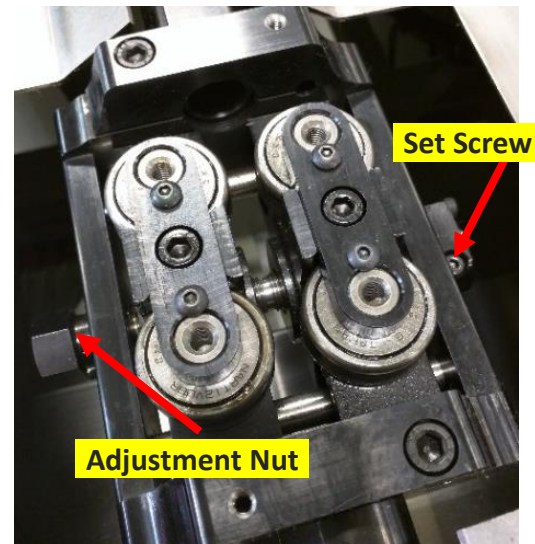
### Action 1: Open Arm Wire Guide Rollers

The first step in this stage, is to open the arm wire guide to adjust the arm wire guide rollers. It is necessary to adjust the arm wire guide before and after feeding wire through the machine.

Arm Wire Guide with Plate



Arm Wire Guide without Plate



1. To do this, remove the cover plate. There are two screws on both sides of the arm wire guide cover plate. Remove these screws and lift off the plate.
2. Loosen the set screw opposite the adjustment nut.
3. Turn the adjustment nut to open the guide rollers all the way. Turning the nut will open or close both sets of rollers simultaneously.





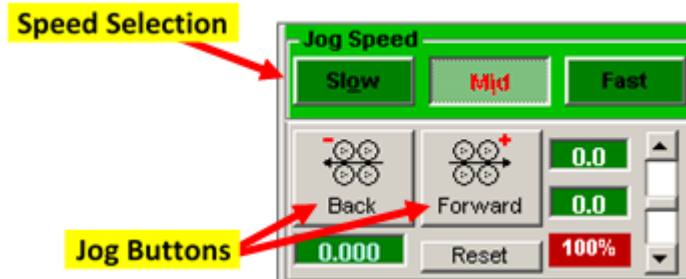
## Caution

*It is very important to always loosen the set screw BEFORE adjusting the adjustment nut. Failure to do so can result in damage to the arm wire guide mechanism.*

## Action 2: Feed Wire through Arm Wire Guide Rollers

Now that the guide rollers have been opened, the wire can be fed through. Go to SmartEditor® and use the manual jog buttons to feed the wire through the arm wire guide.

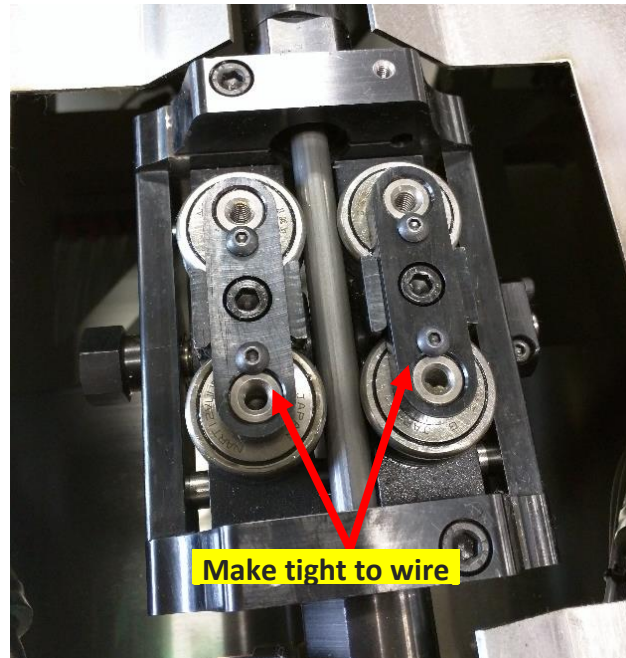
### Jog Controls



1. Select the jog speed, which is operator controlled and has three speed selections, **slow**, **medium** and **fast**.
2. Go at slow or mid speed when feeding the wire.
3. Make sure the wire's path of travel is clear before attempting to feed through the machine, then press and hold the **Forward** button.
4. As the wire feeds, pay attention to the position of the wire. Be ready to stop short of potential collisions of the wire with the guide rollers or the tube.
5. Once the wire is passed the rollers and into the opening of the tube, stop the feeding wire.

### Action 3: Tighten Arm Wire Guide Roller

Now that the wire is through the guide rollers, the rollers can be tightened against the wire.



1. Use the adjustment nut to close the rollers until they touch against the wire.
2. Once the rollers make gentle contact with the wire, tighten slightly to give a little pressure against the wire.
3. Once the rollers are adjusted, retighten the set screw.
4. Replace the arm wire guide cover before running the machine.

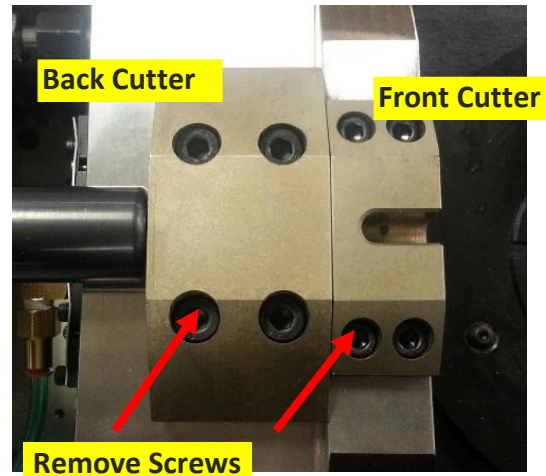


## Caution

*Remember, when adjusting the arm wire guide rollers, too much pressure can cause the wire to not be as straight as possible or even damage the rollers. Too little pressure will not provide enough support to the wire during forming.*

**Action 4: Remove Cutters (if necessary)**

During this stage, it may be necessary to remove the cutter to clear away any debris. This is not a necessary step during the initial setup, but will need to be done from time to time during general usage of the machine.



1. To change the cutters, first remove the four screws holding down the front cutter.
2. Once the bolts are removed, the front cutter can be lifted from the base.
3. Remove the four bolts holding the back cutter in place.
4. After these bolts are removed, the rear cutter can be lifted from the base.

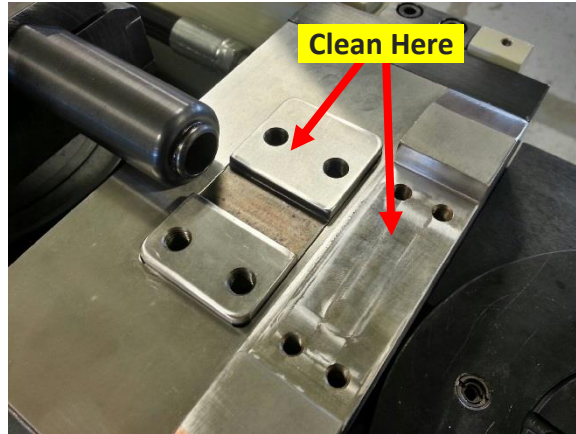


## Caution

*When the cutter is removed, DO NOT rotate the arm. The arm wire guide is not supported by the rear cutter and may be damaged if not held by the arm.*

**Action 5: Clean Cutter Housing**

Next, clean the cutter. Special care should be taken to ensure that the cutter mounting faces are completely free of all debris.



## Caution

*Any dirt trapped underneath the cutters could cause potential misalignment. This can lead to a misfeed of the wire, deformed wire, or damage to the cutters.*

## Action 6: Reinstall Cutters

After cleaning the cutter housing, the cutters themselves can be installed on the machine. It is important that the cutters be installed in the correct orientation.

### Back Cutter



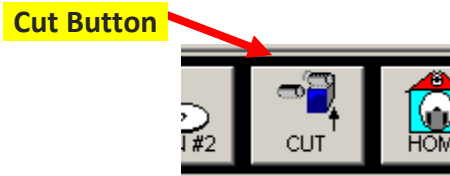
### Front Cutter



1. Mount the back cutter on the machine. Mount this cutter with the rear bushing installed against the arm wire guide. Once the bolts are removed, the front cutter can be lifted from the base.
2. Install the screws, but do not tighten them down.
3. Mount the front cutter piece. Install this cutter so that the shearing face mounts against shearing face of the rear cutter.
4. Install the screws, but do not tighten down.
5. Push the front cutter against the back cutter, so that the front face is flush with the face of the cutter housing.
6. While the front cutter is being held flush to the housing, tighten down the four screws.
7. Pull the back cutter against the front cutter, and tighten down the four screws.

### Action 7: Feed Wire through the Cutters

With the cutters installed, the wire can now be fed out through the front of the machine. Use the manual jog buttons to feed the wire from the arm wire guide, out through the end of the cutter.



1. Once the wire is fed out the end of the front cutter, cycle the cutter from SmartEditor® to trim the wire flush.
2. To do this, Press CTRL and the Cut button at the same time to cycle the cutter.



## Setup Arm Wire Guide/Cutter Assembly Activity

Use your machine and the steps covered to setup the arm wire guide and cutter assembly. For more detailed steps, refer back to the Setup Arm Wire Guide/Cutter Assembly module.

- Action 1:** Open Arm Wire Guide Rollers
- Action 2:** Feed Wire through Arm Wire Guide Rollers
- Action 3:** Tighten Arm Wire Guide Rollers
- Action 4:** Remove Cutters (if necessary)
- Action 5:** Clean Cutter Housing (if necessary)
- Action 6:** Reinstall Cutters
- Action 7:** Feed Wire through the Cutters

**Note any questions you have as you perform the setup, then review the online modules to address your questions.**

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## Setup Bender Assembly

The following steps describe how to setup the bender assembly. Review the steps, then complete the activity at the end of this section.

### Action 1: Home the Machine

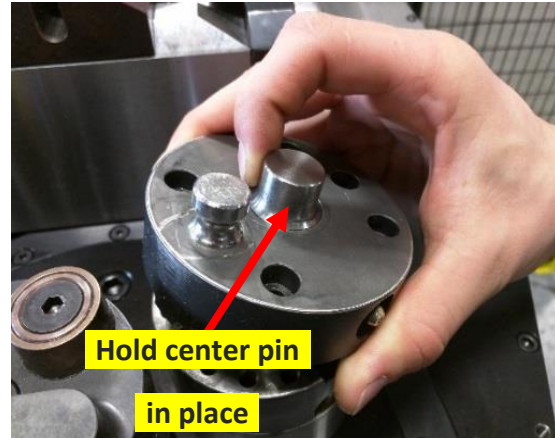
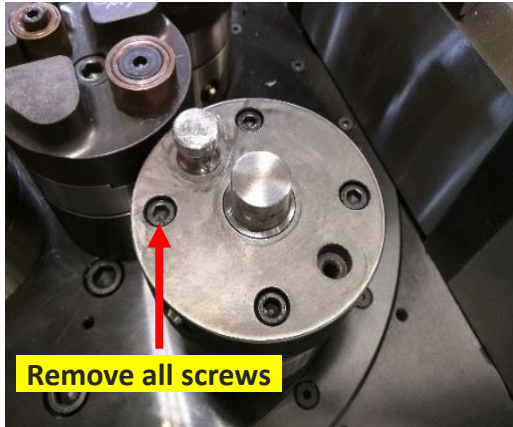
Before setting up the bender assembly, you will need to home the machine.



1. To home your bender assembly, press CTRL and the Home button, located in the machine controls.

## Action 2: Uninstall the Mandrel

If the mandrel is already installed, you will need to remove it.



1. To uninstall a mandrel, first remove the four screws holding it down. While holding the center pin in place.

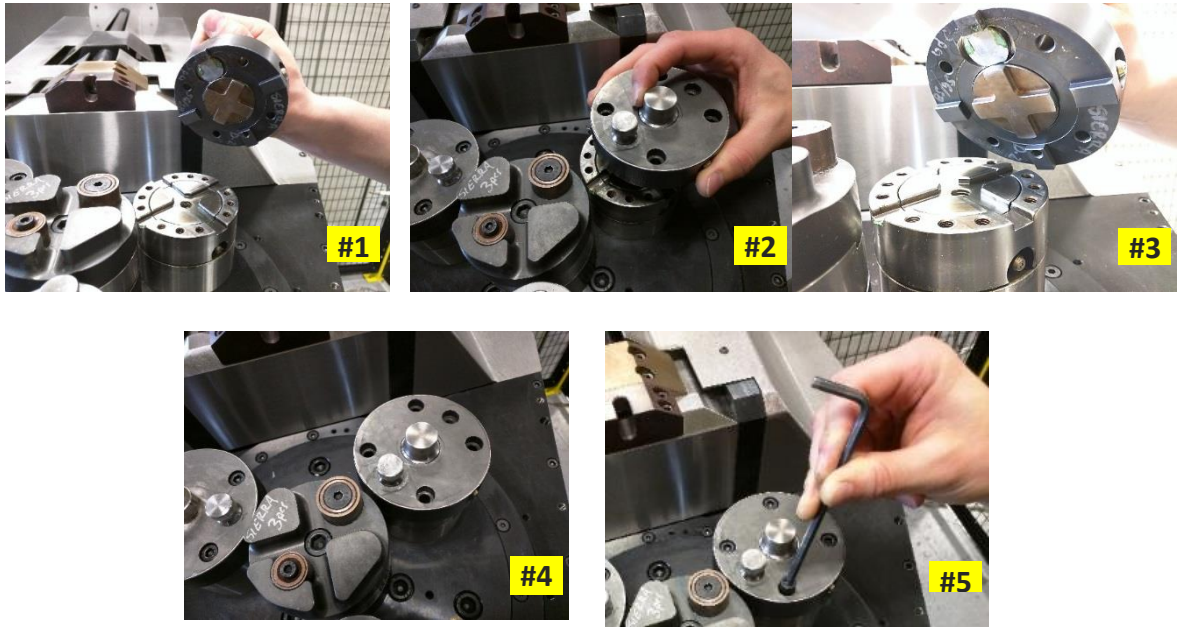


### Caution

*Securing the center mandrel pin when removing the mandrel tool is very important. Failure to do so could cause damage to the tooling.*

### Action 3: Mandrel Installation

Most mandrel tools can be installed in any position. However, the mandrel bending pin must be installed in the mandrel number 1 position to be controlled accurately through SmartEditor®.

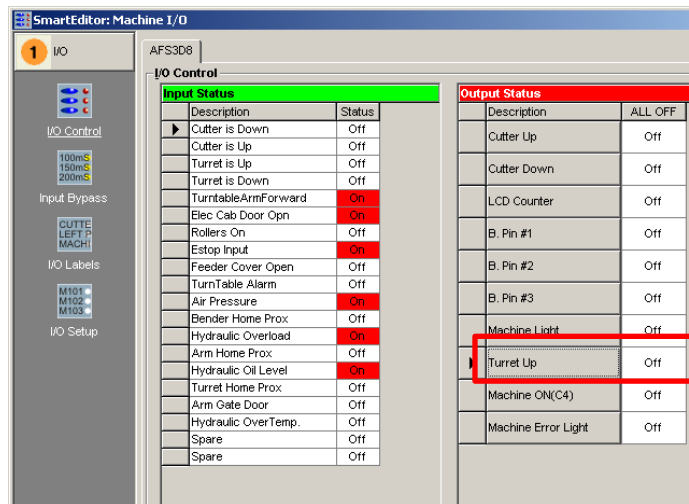
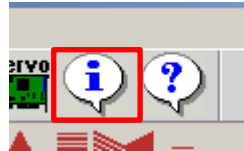
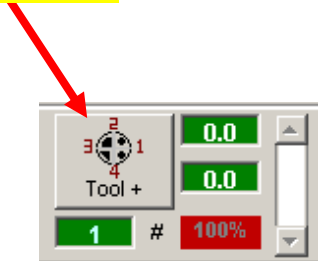


1. To install the mandrel, hover the tool over the position you wish to install, then rotate the mandrel until the bending pin points towards the center tool cluster.
2. The center mandrel pin should be rotated until the keyway of the pin lines up with the keyway of the inner mandrel shaft.
3. The mandrel is then fitted on to the mandrel shaft.
4. Once fitted, insert and tighten the four screws to hold the mandrel in place.

### Action 4: Cluster Removal/Installation

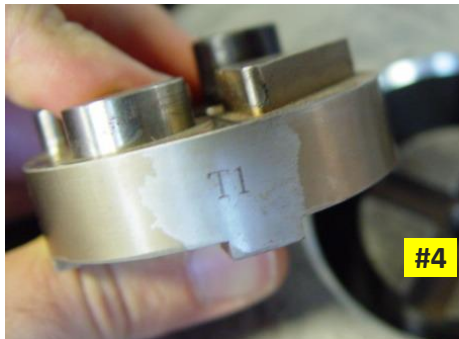
It is good practice to verify that the tool is in the Tool #1 position before removing or installing the tool cluster. Remember, both the mandrel and Tool cluster position can be verified from the jog window under the tool position button.

#### Tool Position



1. To loosen the screw holding the tool cluster in place, you must raise the turret shaft to lock it in position and prevent it from rotating.
2. Go to the Menu bar of SmartEditor® and select the Machine Status window icon or the “i” icon. The Machine I/O screen appears and from here, you can raise the turret.
3. Click the “Turret Up” button. This will turn that button on.
4. Click Close.
5. Next, remove the center screw and lift off the tool cluster.
6. Once the tool cluster is removed, locate the T1 engraved on the replacement cluster and rotate the tool so the T1 mark or other marking faces the front of the bender arm assembly. Align the keyway on the bottom of the tool to the keyway of the T1 shaft and connect the tool to the shaft. (see images on the next page)
7. If T1 is not engraved on the tool cluster, check the tool print or other documentation for the correct orientation.

8. After the tool cluster is attached to the bender, replace and tighten the screw to secure the tool cluster in place.
9. Once the changeover is complete, press F2 from the programming grid or go to the Machine I/O screen again and click off the "Turret Up". This will lower the turret shaft.
10. Home the machine to complete the bender assembly setup.





## Setup Bender Assembly

Using your AccuForm 3D Machine, set up the bender assembly by completing the steps below. Review the previous steps for more detail.

- Action 1:** Home the machine
- Action 2:** Uninstall the Mandrel
- Action 3:** Mandrel Installation
- Action 4:** Cluster Removal/Installation

**Note any questions you have as you perform the setup, then review the online modules to address your questions.**

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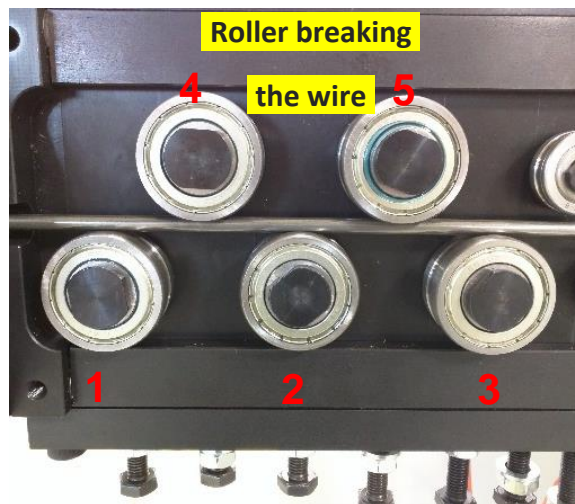


## Straighten Wire

The following steps describe how to straighten the wire. Review the steps, then complete the activity at the end of the section.

### Action 1: Setup Adjustment Rollers

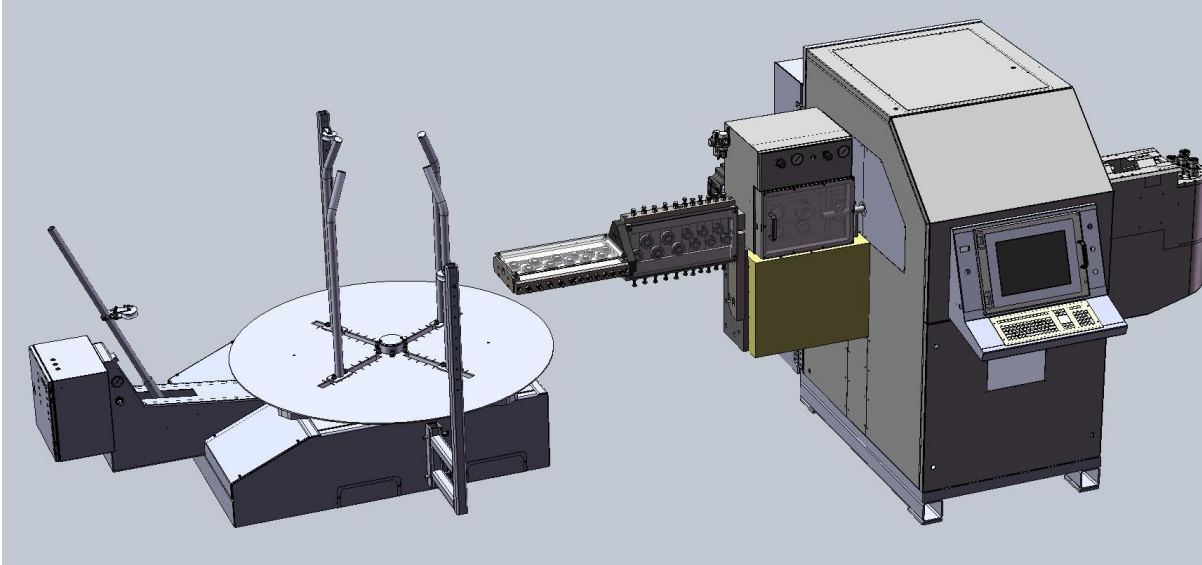
Now that the reference rollers have been set and the wire has been passed through the feeder, as performed in previous setup actions, it is now time to set the adjustment rollers.



11. To adjust these rollers, tighten down the bolt on the side of the straightener for roller #5 until it makes gentle contact with the wire. Next, tighten #4 until it puts a slight kink in the wire. This is referred to as “breaking” the wire.
12. As a starting point, break the wire approximately 1 – 1½ wire diameters past the centerline. Insure that you do not over-break the wire.
13. Make the adjustment on both the horizontal and vertical straightener.

## Action 2: Verify Complete Machine Setup

The next step is to verify the complete setup of the machine. To do this check every step taken up to this point to setup the machine.



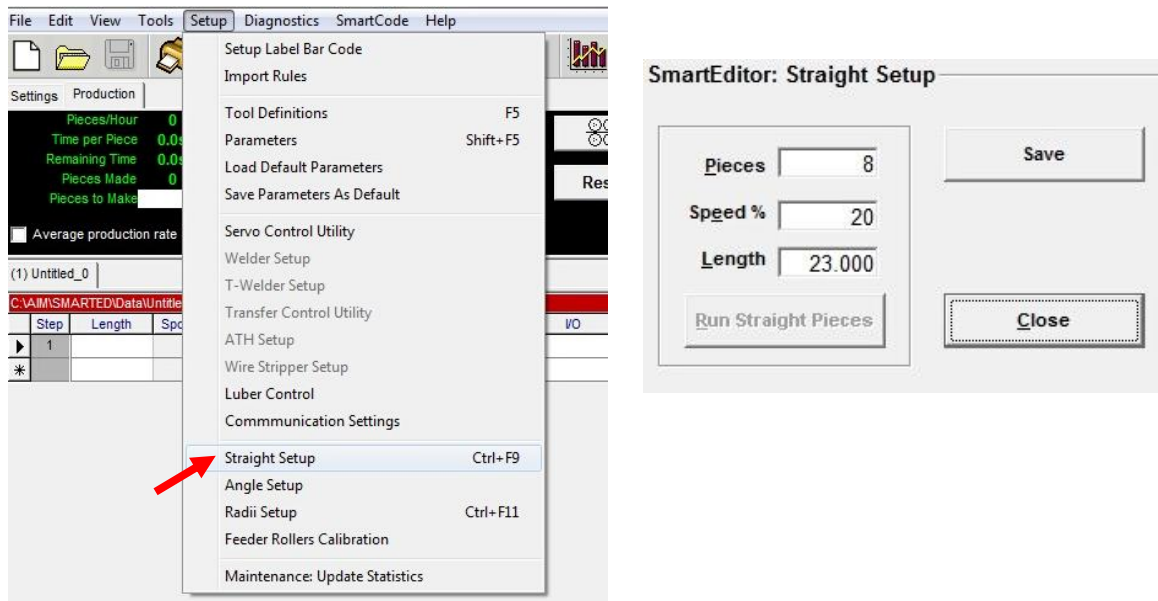
If any of the steps were not performed correctly, the machine will not run. All steps must be done properly to prevent the material from jamming or the wire not straightening through the machine.

If you forgot any of the steps, you can go ahead and review earlier setup and usage steps.



### Action 3: Straight Setup Entry

Once all the steps have been verified, and the entire machine setup is complete, it is recommended that you run the straight setup in SmartEditor®.



1. To run the Straight Setup, go to the main SmartEditor® window, and click **Setup**, then **Straight Setup** or press CTRL and the F9 key. The Straight Setup window appears over the main programming grid.
2. enter the quantity of pieces fed, the percentage speed they should feed, and the length to feed for each piece.
3. If the Straight Setup parameters were modified, click the Save button to save the new settings.



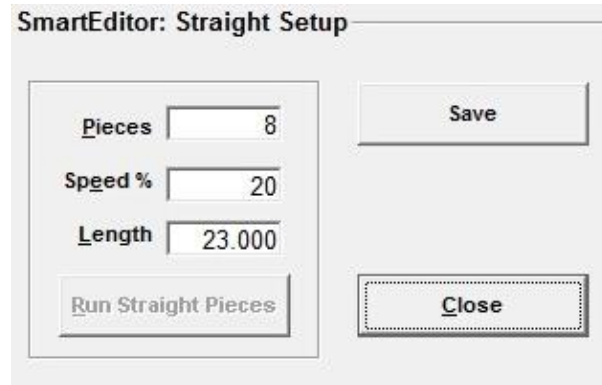
## Caution

*Remember, do not run the speed percentage too fast. The higher the percentage, the faster the machine will run. For safety purposes, it is recommended to use a feed speed percentage that allows you to react to the machine.*

**Action 4: Run Straight Setup**

Now that the options have been selected, you are ready to run the Straight Setup.

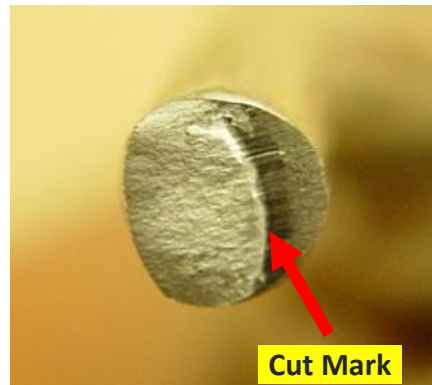
This will execute the parameters set in the Straight setup window.



1. To run the straight pieces, hold the Ctrl key on the keyboard and tap the "Run Straight pieces" button. This is a two-handed operation to ensure safety.
2. The Straight Setup window should be left open, as you move to the next steps.

**Action 5: Inspect the Wire**

The cut mark should always be held in vertical alignment and perpendicular to your right side when looking down the length of the wire. This ensures the wire is mimicking the same directions in which it was fed off the machine. The wire must be held with the cut marks in the same direction, the marks appeared when exiting the cutter. You should be able to see the wire curving in the horizontal, vertical, or possibly both, directions.

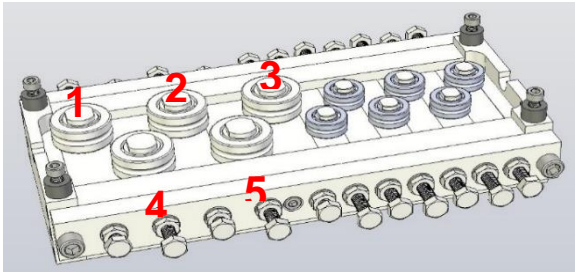


1. Observe this direction and then make the necessary correction to the straightener. The Straight Setup window can be kept open as you move to the next step.

### Action 6: Adjust the Wire

Adjustments should not be made in both planes at once. Adjust only the horizontal or the vertical direction. Adjustments that are made in one plane can influence the straightness in the other. Start correcting in whichever plane requires the most adjustment.

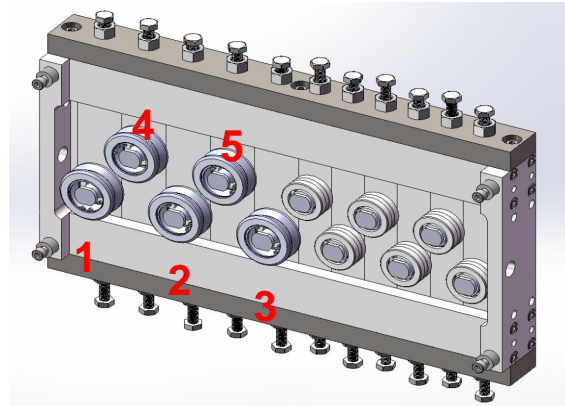
**Horizontal Plane**



When wire is curving left or right, adjustments should be made in the **horizontal plane** of the straightener

- If the wire is curving left, then apply pressure by adjusting roller #5.
- If the wire is curving right, then decrease the pressure on roller #5 or apply pressure by adjusting roller #4.

**Vertical Plane**



When the wire is curving down or up, adjustments should be made to the **vertical plane** of the straightener.

- If the wire is curving down, then apply pressure to roller #5.
- If the wire is curving up, then decrease pressure on roller #5 or apply pressure to roller #4.

Continue to run the Straight Setup and make adjustments to one plane at a time until the wire is straight. When the wire is straight, click the “Close” button in the Straight Setup window. The machine setup is now complete and ready to run production.



## Tip

*Occasionally you will make so many adjustments that you are not able to align the wire. In this case, remove all pressure from rollers 4 and 5 and repeat the steps to run the Straight Setup, inspect the wire and adjust the wire.*



## Tip

*As the wire gets closer to being straight, smaller amounts of adjustment will be needed. One tip we suggest is to place the wrench on the bolts and think of turning the heads like a clock. Try tightening a roller from 12 o'clock to 3 o'clock. You may find that this adjustment is too much, but you now know that the position is somewhere between 12 and 3 o'clock.*



## Caution

*Remember that adjustments are relative to wire size. Larger diameter wires will require larger adjustments and smaller diameter wires will require relatively larger adjustments.*

**Action 7: Repeat Actions 4-6, if necessary**

If the wire is still not straight at this point, you can repeat the steps of running the Straight Setup, inspecting and adjusting the wire.

This concludes the 3D AccuForm Synchro machine setup and usage.



## Straighten Wire

The final procedure of the machine setup and usage process is to set up, run and straighten the wire using the 3D AccuForm Machine. Using your machine, follow the steps below to straighten the wire. For more detailed steps, refer back to the Straighten Wire module.

- Action 1:** Setup Adjustment Rollers
- Action 2:** Verify Complete Machine Setup
- Action 3:** Straight Setup Entry
- Action 4:** Run Straight Setup
- Action 5:** Inspect the Wire
- Action 6:** Adjust the Wire
- Action 7:** Repeat Actions 4-6, If Necessary

**Note any questions you have as you perform the setup, then review the online modules to address your questions.**

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