



3991 Green Park Road • St. Louis, MO 63125 • Phone – 314.631.1416 Fax – 314.631.3003

# CR14-TDFC

## OPERATING & PROCEDURES MANUAL





CINCINNATI PRECISION MACHINERY 513-860-4133



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**DO NOT ATTEMPT TO OPERATE THIS EQUIPMENT  
BEFORE READING AND UNDERSTANDING THE  
INFORMATION PRESENTED IN THIS MANUAL**

**If You Have Any Unresolved Questions You May Contact  
Customer Service at Ductformer**

All Machine Guarding Must Be In Place and Properly Secured Whenever The Machine Is Running or Under Power.

**Disconnect Power Before Servicing.**

**OPERATOR SAFETY REMINDERS**

The National Safety Council reminds us that many accidents are caused by the failure to follow fundamental safety or precautions. For this reason you as a careful operator are the best insurance against an accident.

**UNLESS OTHERWISE NOTED. DO NOT MAKE ANY ADJUSTMENTS OR LUBRICATE THE MACHINE(S) WHILE THEY ARE IN MOTION.**

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## Rollformer Machine Specifications

### 1.1. Rollform Head

- 14 Forming Stations
- 1 Outboard Forming Positions
- 1 Inboard
- 1 1/4" Diameter Roller Shafts
- 4 3/4", 5 1/4" Vertical Center Distance Between Roller Shafts
- 5" & 7" Horizontal Center Distance Between Roller Shafts
- 6.00" Inboard Roll Space
- 6.00" Minimum Part Length with Short Part Feed

### 1.2. Tooling Installed

Description	Gauge	Material Used
• TDFC Edge Form Flange Rolls	18-24	2 inches

### 1.3. Drive and Gear Reducers

- 55 Feet per Minute (Constant Speed)
- 7 ½ Horsepower Electric Motor
- Oil Bath Reducer Drive
- Anti-Friction Roller Bearings
- All Gear Drive

### 1.4. Electrical

- 240/480 Volts, 60 Cycle, 3-Phase (7 ½ Horsepower Motor)
- 220 Volt, 60 Cycle, 1-Phase (Optional)

### 1.5. Machine Base

- 124" Long x 30" Wide x 47" High – 38" Pass Line
- All Welded Frame Construction
- Shipping Weight: 2,500 Pounds



## 2. Unloading and Installation

### 2.1. Receiving the Machine

- Visibly check machine for possible shipping damage.
- If damage is evident, insist on a notation on the freight bill and photo document the damage immediately along with a hand written description of apparent damage.
- If repairs are necessary, contact Ductformer by phone at 314.631.1416 you may be requested to E-Mail or Fax your damage documentation to Ductformer.
- Do Not put damaged equipment under power until proper repairs have been made by a qualified service technician.

### 2.2. Unloading Procedure

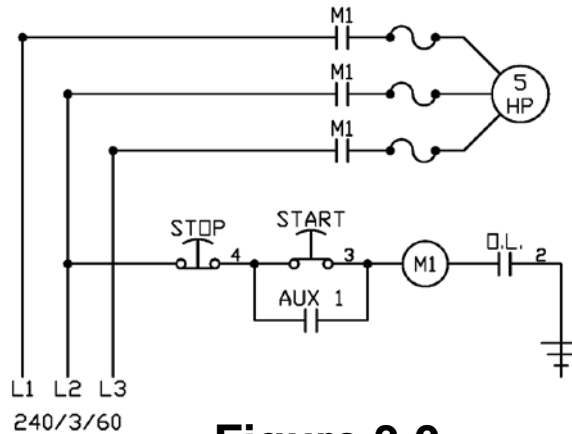
- When unloading the machine off of the transport vehicle, the machine is best handled by lifting the machine from the side just under the Side Frame. Make sure Forks extend through to the other side of the machine.
- Move the machine to the desired location and visually inspect machine thoroughly before installing power.
- Never lift the machine by the Infeed or Outfeed Tables. This would result in excessive damage to the machine and void the warranty for such damage.
- After moving the machine to desired location, level and secure the machine to the floor as required.

### 2.3. Electrical Connections

- Supply electrical service to the starter box in accordance with National and Local Electrical Codes.
- Refer to the connecting instructions on the inside of the starter box.
- Note: It is possible to initially wire the 3-phase motor in reverse. If this happens, switch two (2) of the three (3) supply wires. This will correct the rotation of the motor. Always check for proper feed direction on machine designed to operate on 3-phase power before feeding any material into the machine.

ONLY UPON THE SATISFACTORY COMPLETION OF ALL OF THE ABOVE CHECKS AND THE PERFORMANCE OF THE INITIAL INSTALLATION PROCEDURES SHOULD THE MACHINE BE ALLOWED TO BE POWER UP OR RELEASE FOR PRODUCTION USE.

### 3. Electrical Schematic



**Figure 3.0**

### 4. Maintenance

#### 4.1. Routine Maintenance

No repair or maintenance should be performed while the machine is running or capable of running. Proper Lockout/Tagout Procedures should be followed. Turn all machine controls off before shutting of the Main Electrical Disconnect to prevent Startup when power is restored. Kill all Electrical Power at the Main Electrical Disconnect before performing any maintenance or repairs to the Machine. After a repair check the entire machine carefully to determine if the machine was properly reassembled before power is restored.

- Open face gears should be lubricated with a light coat of open face gear grease every 600 hours of operation.
- Gear reducer should be checked periodically for fluid level and topped off whenever needed. Use a synthetic lubricant such as Mobil SHC 634
- Periodically Roll Tooling should be sprayed down with WD-40 or Marvel Mystery Oil to keep them free of metal buildup
- Note: The machine is supplied with lifetime lubricated bearings on all Roll Shafts, Idler Gear and Transfer Shafting; however the machine should be inspected for dirt and debris that may have collected during Daily Usage.
- All bolts should be checked for tightness every 6-months.

#### 4.2. Recommended Lubricants

- Gear Box Reducer: Synthetic Lubricant Mobil SHC 634
- Roll Tooling: WD-40 or Marvel Mystery Oil
- Gears: Light Coat of Open Face Gear Grease
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## 5. General Construction, Factory Settings and Adjustments

### GENERAL NOTES AND CAUTIONS:

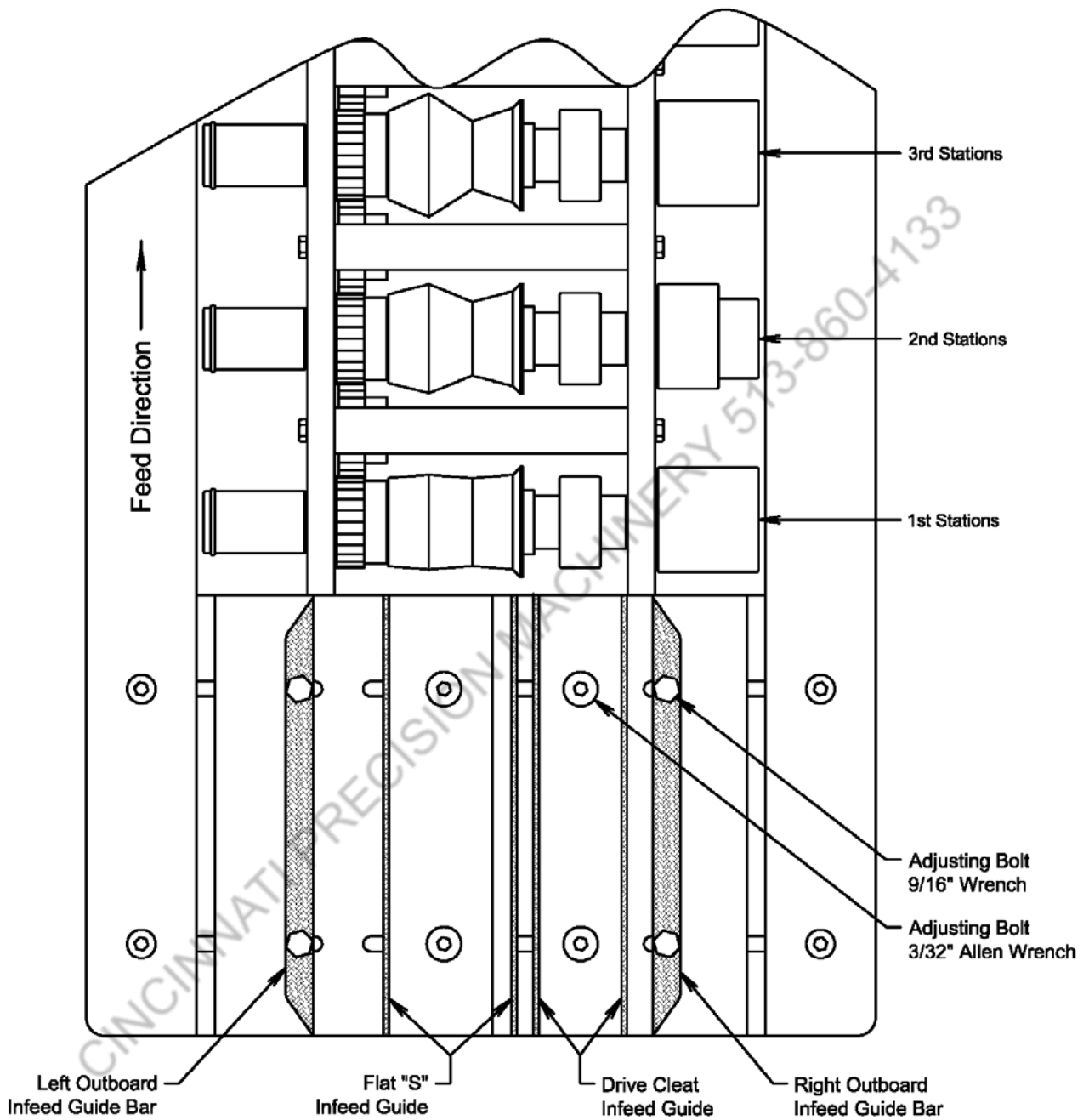
- This machine and its installed tool are designed for a specific thicknesses range of Galvanized Mild Steel. Check Gauge Capacity for the tooling supplied. Do not feed material other than the specified for the specific tooling installed in the machine.
- Do not exceed the specified minimum or maximum material thickness for the specific installed tooling, settings and adjustments.

<b>Reference:</b>	<b><u>Gauge</u></b>	<b><u>Material Thickness</u></b>
	26	0.018"
	24	0.024"
	22	0.030"
	20	0.036"
	18	0.048"

### 5.1. **Entrance Guide Settings (General)**

- The Entrance Table is located at the front of the machine which supports the material being fed into the Roll Tooling. Entrance Guide Bar is fastened on the top of this table. The Entrance Guide Bar was set at the factory and tested prior to releasing the machine for delivery.
- The Entrance Guide Bar aligns the material as it is fed into the Roll Tooling. Its exact location was determined and set during final machine testing and it is important that they remain set accurately. A loose or inaccurate setting of the Guide Bars will cause the material to feed improperly resulting in one or more of the following: material edge run out, poorly formed parts, jamming of the material in the machine.
- To produce a good TDFC Section it's important the Infeed Guide is aligned with the Roll Tooling and to hold the material against the Guide as it feeds through the Rolls. The Return Flange should be a constant dimension down the length of the Section formed. If the Part walks away from the Guide and out of the Rolls check the Gap and Spring Tension of the Upper Rolls.
- An Allen Wrench is required to make adjustments to the Infeed Guide Bar
- The Infeed Guides must be square and parallel to the Rolls using a Straight Edge Tool.



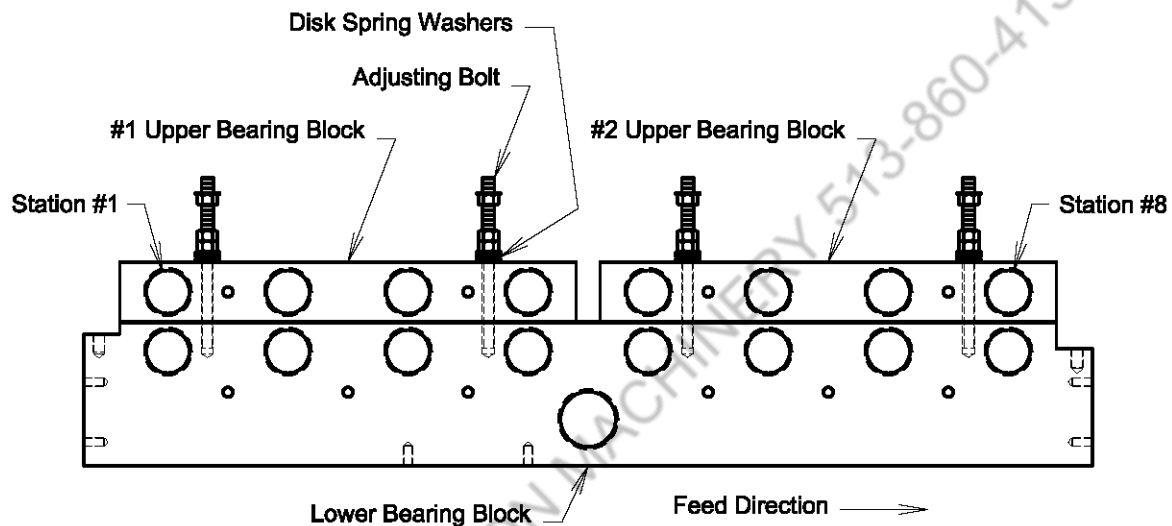


Typical Infeed Guide Setup

Figure 5.1

## 5.2. Machine Configuration

- This machine is a Fourteen (14) Station Rollformer consisting of a Lower Bearing Block Assembly and Two (2) Upper Bearing Block Assemblies. See Figure 5.2.
- The Upper Bearing Blocks are spring loaded to compensate for material thickness variations for each Roll Set.

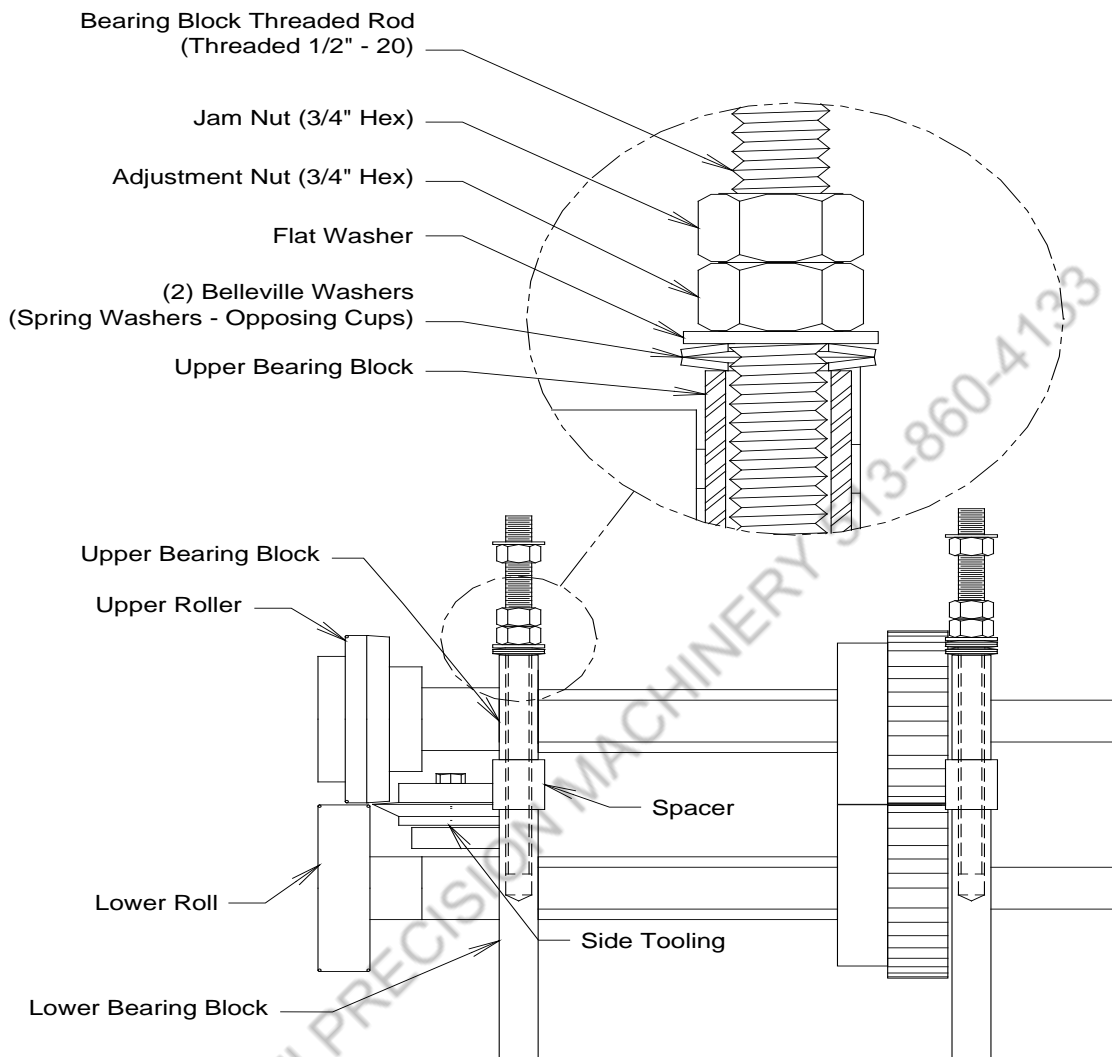


**Side View, Showing Upper and Lower Bearing Blocks**

**Figure 5.2**

## 5.3. Factory Spring Load Adjustment

- Adjustment Procedure - See Figure 5.3.
  - 1 Break the Jam Nut loose from the Adjusting Nut and back-off counter-clockwise (at least two full turns).
  - 2 Tighten the Adjusting Nuts (down / clockwise) to fully compress the Disk Spring Washers.
  - 3 Then, back-off the Adjusting Nut (counter-clockwise) one half turn (180°).
  - 4 Hold the Adjusting Nut in place and tighten the Jam Nut to the Adjusting Nut to hold the Spring Load Setting.
- The above procedure is typical for all Adjusting Bolts



**Front End View, Showing Spring Pressure Adjustment**

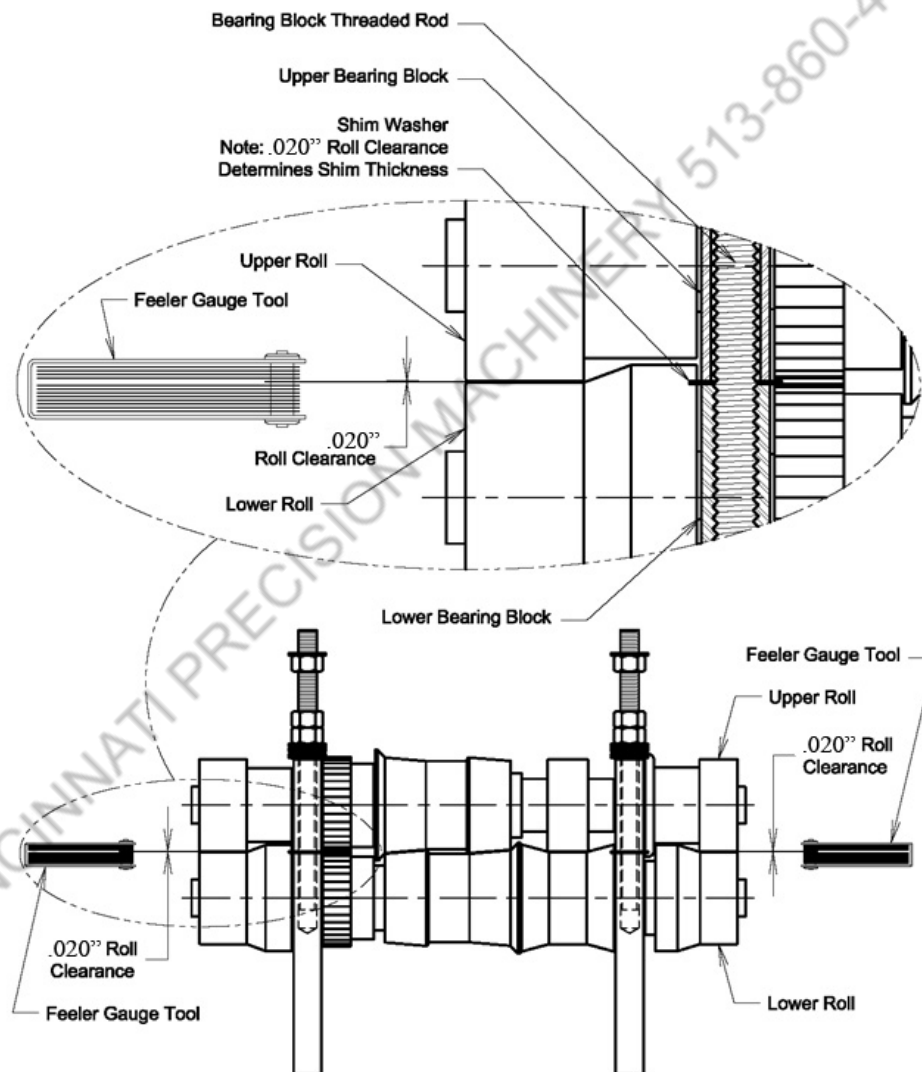
**Figure 5.3**

**5.4. Roll Clearance**

- Clearance is the Gap Setting between the Top and Bottom Rolls and is set by shimming the gap between the Upper and Lower Bearing Block Assemblies. (See Figure 5.4)
- If the clearance between the Rolls is Greater than the Minimum Thickness of the Sheet Metal formed the Sheet Metal may not track properly through the Rollformer.

### 5.5. Checking and Setting the Roll Gap

- To check the Roll Gap slip a Feeler Gauge between the Upper and Lower Outboard Rolls, down both sides of the Rollformer. There should be No Less than 0.015" or More than 0.020" Gap. (See Figure 5.4)
- This setting was shimmed to the proper clearance at the factory and it should not be necessary to change the shimming unless the machine had been completely disassembled or rebuilt.
- Before Re-shimming or changing the Gap Setting check the Spring Load Adjustment and the Threaded Rod into the Lower Bearing Block Assembly. If the Threaded Rod or Adjustment Nut has stripped or backed-off (loosened), it would open or widen the Gap Setting.



Front End View, Showing Roll Clearance Setting

Figure 5.4

### 5.6. TDFC (18-24 Gauge)

- **Material Thickness:**

<u>Gauge</u>	<u>Material Thickness</u>
24	0.024"
22	0.030"
20	0.036"
18	0.048"

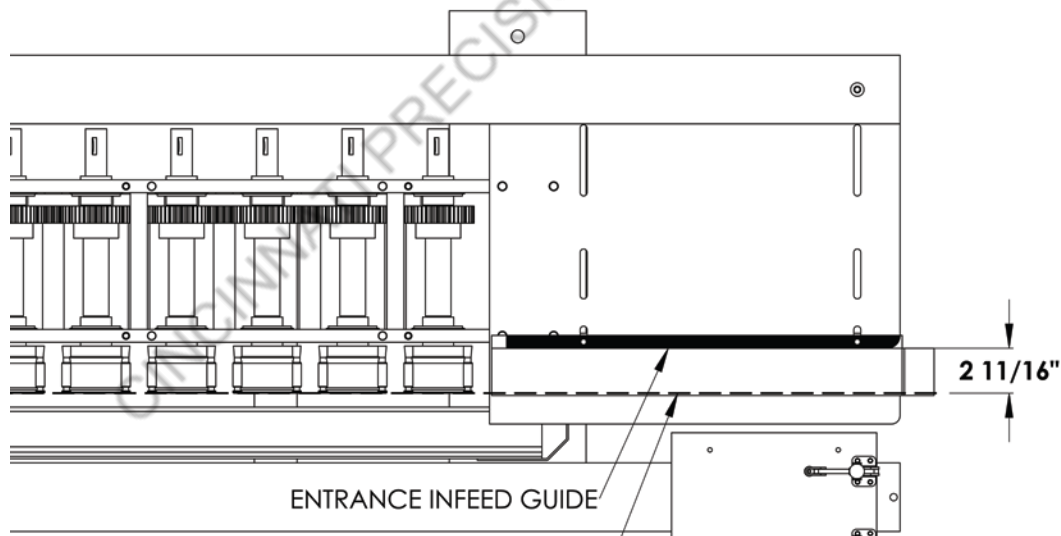


**TDFC Cross Section**

- **Material Used: 2"**

#### (a) Hem Length Adjustment

- To produce a good TDFC Section it's important to maintain a Consistent Hem Length
- Two (2) things are important to produce Consistent Hem Length: 1<sup>st</sup> The Guide must be parallel to the Rollformer Tooling and 2<sup>nd</sup> the Entrance Infeed Guide needs to be in the Proper Position.
- Figure 5.5a below shows the Proper Distance the Entrance Infeed Guide Rollers should be from the Roll Tooling Outer Surfaces.



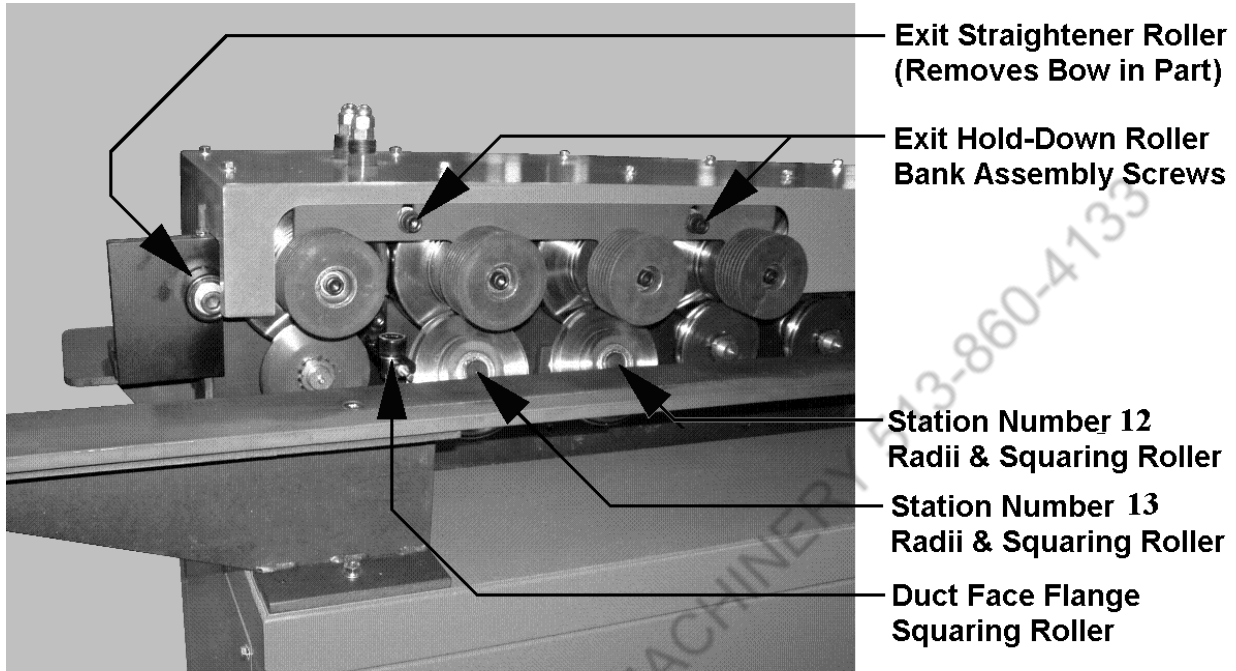
**Figure 5.5a**

**(b) 90° Outer Flange Squaring Station (Station Number 8)**

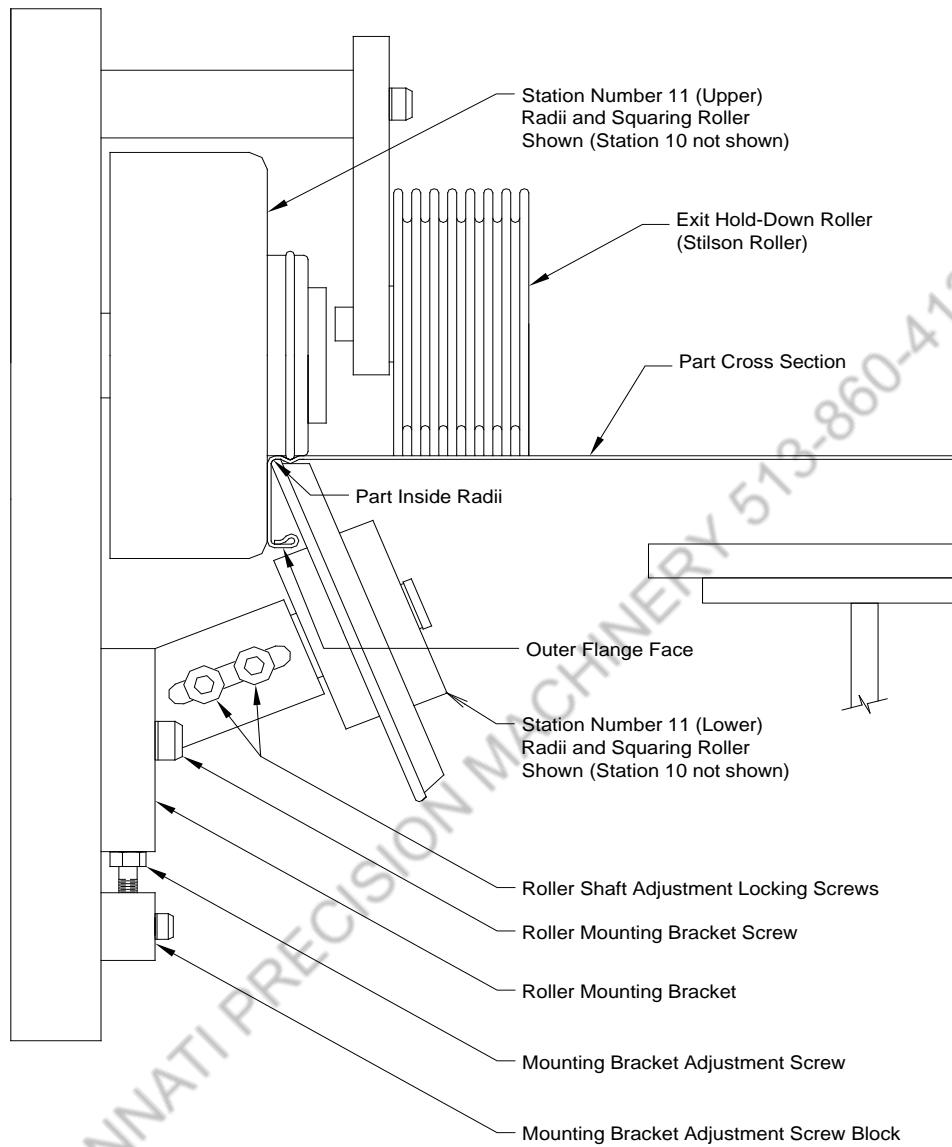
- Station Number 8 is designed to sharpen and square the 90° Outer Flange. Note, the Tooling was set at the factory, however if the Part Flange is not satisfactory or has a problem feeding first check for a Consistent Hem Length. (See Section 5.5a to correct Hem Length) If the Part Hem is correct and the Flange is not coming out square you may need to adjust the Number 5 Lower Roller.
- To adjust Station Number 8: Loosen the Lower Roller Bracket Mounting Screws and set the Adjustment Screw up or down to achieve a 90° flange with a relatively small inside radius. This should be done in small increments (60° turns on the Adjustment Screw).

**(c) 90° Inside Flange Squaring Stations (Stations Number 12 and 13)**

- Figure 5.5b shows Station Numbers 12 and 13.
- Station Numbers 12 and 13 are designed to sharpen and square the 90° Inside Flange. Note, the Tooling was set at the factory, however if the Rollers have moved and the Part Flange is not satisfactory these stations may require adjustments.
- To adjust Station Number these stations:
  - Horizontal Adjustment - See Drawing 5.5c - Loosen the Roller Shaft Adjustment Locking Screws and move the Roller in or out to achieve a 90° flange. This should be done in small increments in conjunction with Vertical Adjustments to achieve a relatively small inside radius at 90° and then retighten the Roller Shaft Adjustment Locking Screws
  - Vertical Adjustment - See Drawing 5.5c - Loosen the Roller Mounting Bracket Screws and adjust the Roller Mounting Bracket up or down as required by turning the Mounting Bracket Adjustment Screw up or down (in or out) as required and then retighten the Roller Mounting Bracket Screws



**Figure 5.5b**

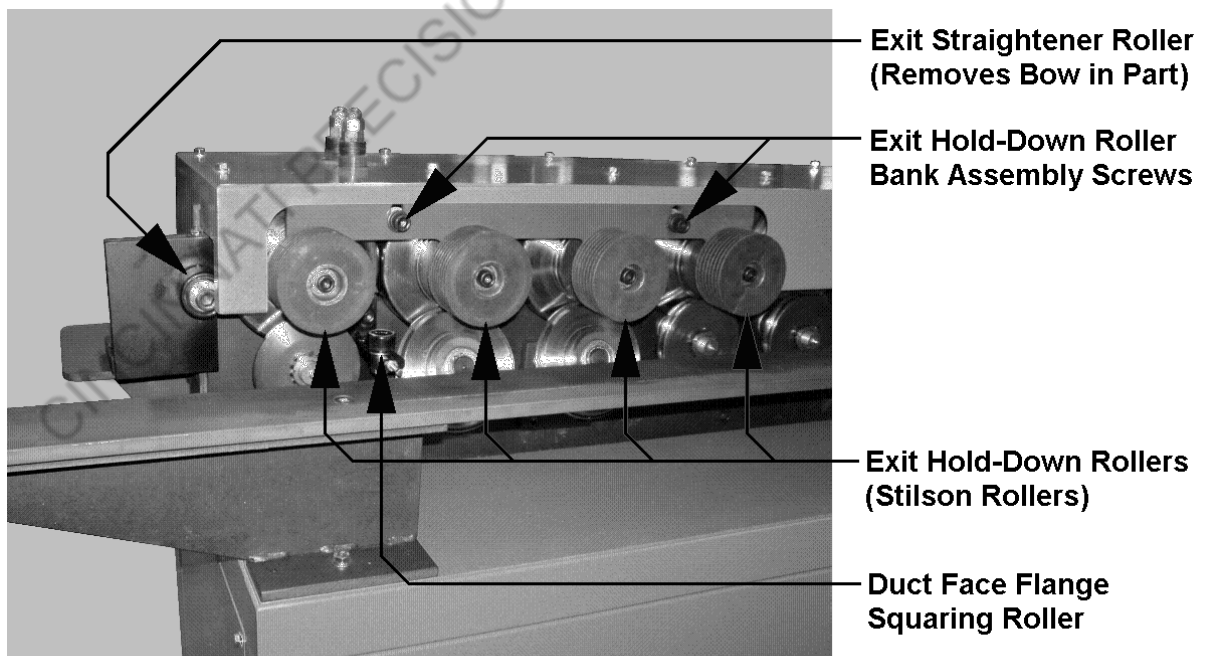


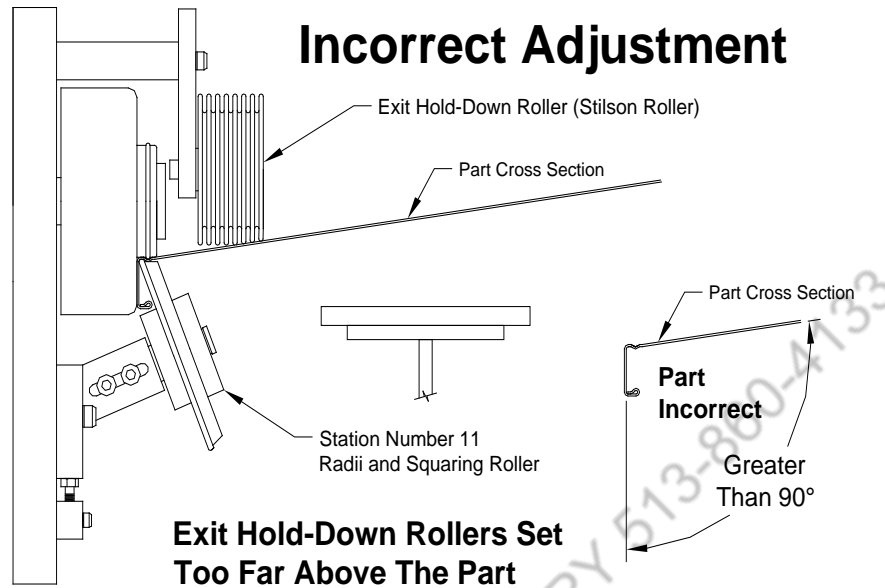
**Drawing 5.5c**



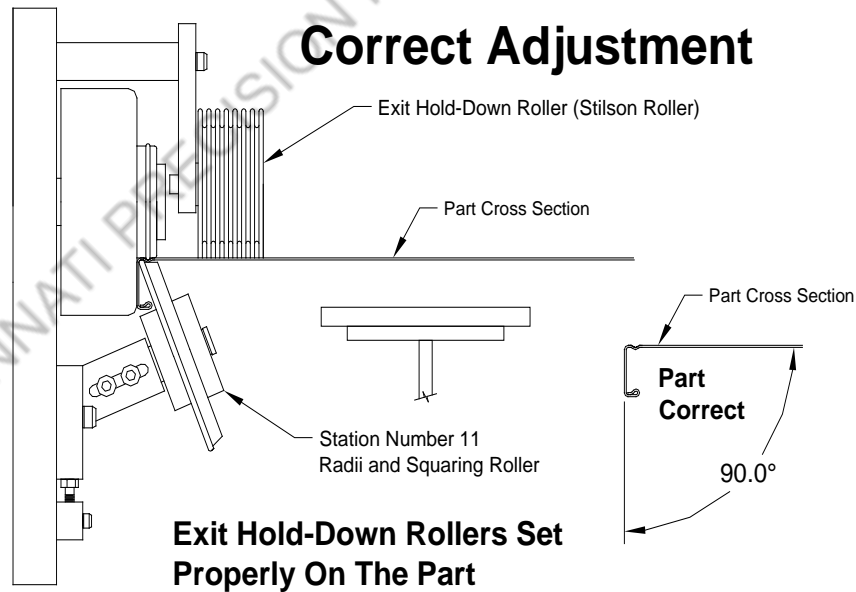
**(d) Hold-Down Rollers**

- The Hold-Down Rollers (Stilson Rollers) are located above the exiting part and are designed to hold the material down and level as it passes through the last four forming stations. (See Figures 5.5d & 5.5e)
- The Exit Hold-Down Rollers have been set prior to leaving the factory and should not require adjustment; however if the part is not running level or if the Mounting Flange is not coming out square after making adjustments to the Duct Face Flange Squaring Roller (See instructions 5.5e) the Hold-Down Rollers may require adjusting.
  - If the Mounting Flange is Under-Formed (Greater than 90°) adjust the Exit Hold-Down Rollers Downward (See Drawing 5.5d).
  - To make adjustments loosen one Exit Hold-Down Roller Bank Assembly Screw and then snug to permit movement when hand tapped. Then do the same for the other Screw.
  - Hand tap up or down as required, making adjustments in small increments at a time.
  - Retighten both Screws and check for square.
  - If the Exit Hold-Down Rollers are set too low the Parts Leading Edge will crash into and cut the rollers.

**Figure 5.5d**



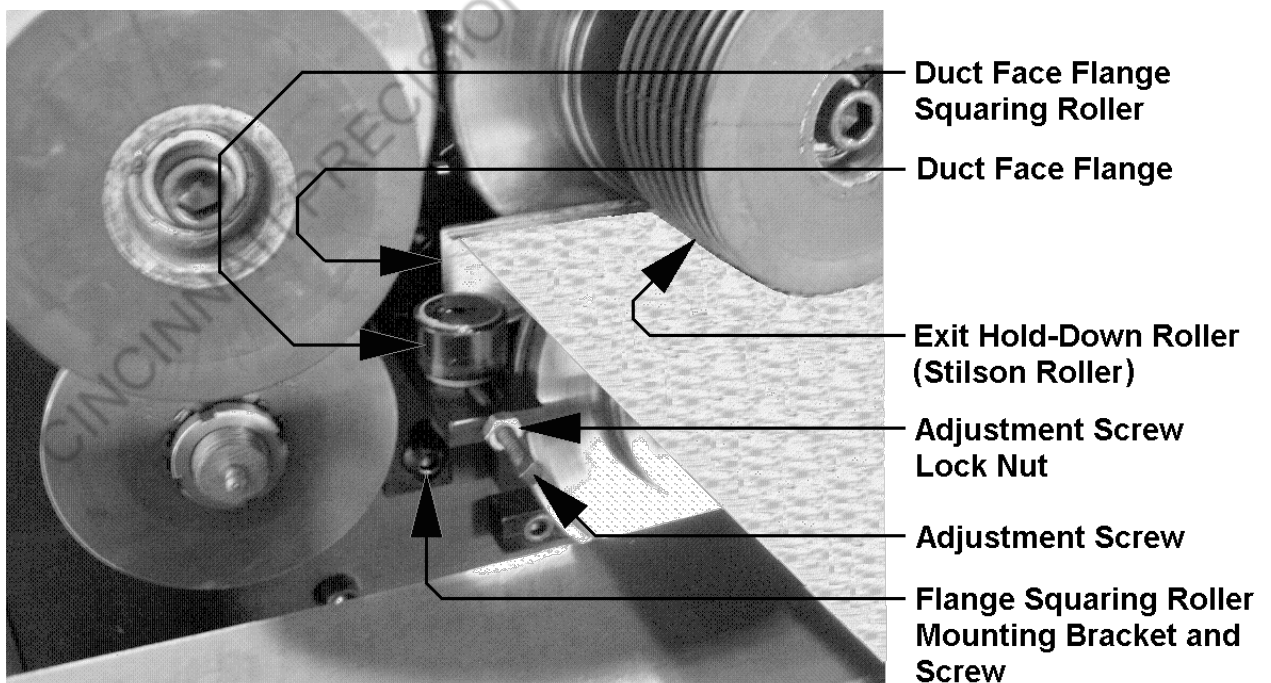
**Note:** If the Exit Hold-Down Rollers are set Too Low (not shown) the Part's Leading Edge will crash into and cut the Rollers.



**Drawing 5.5e**

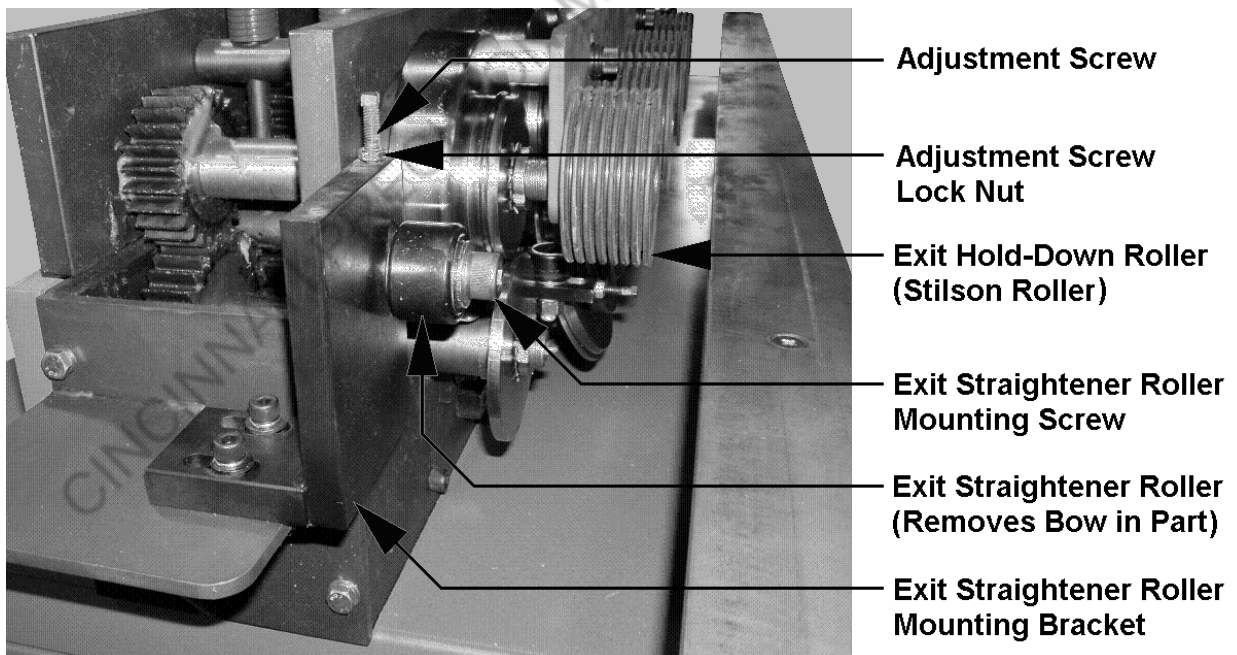
**(e) Duct Face Flange Squaring Roller**

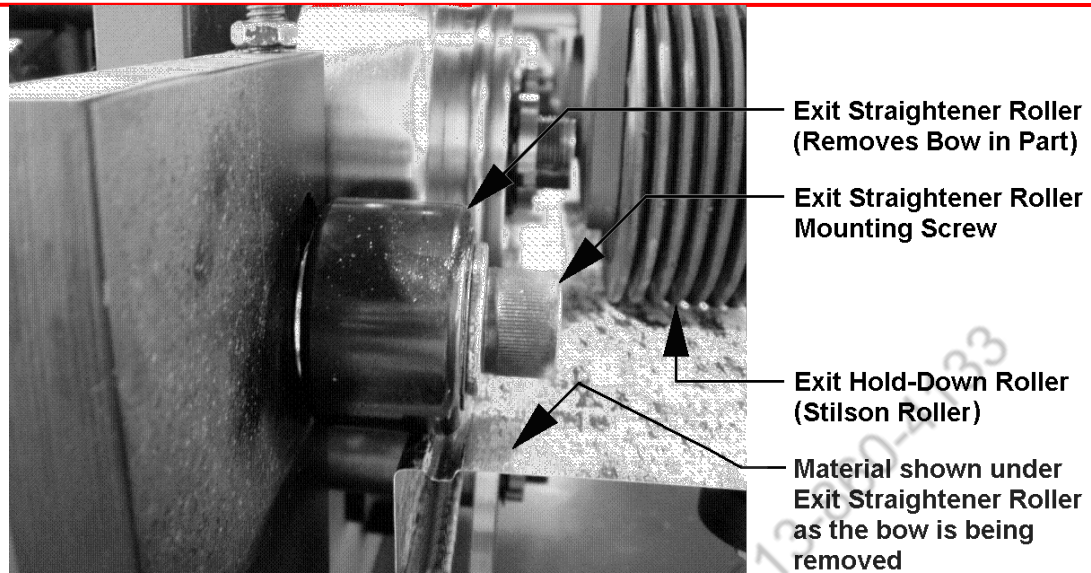
- The Duct Face Flange Squaring Roller is located between the last two forming stations, under the exiting part. It is designed to square-up the Duct Face Flange as it passes into the last forming stations. (See Figure 5.5f)
- The Duct Face Flange Squaring Roller was set prior to leaving the factory and should not required adjustment, however if the Duct Face Flange is not coming out square the Roller may require adjusting.
  - If the Duct Face Flange is Over-Formed (Less than 90°) adjust the Squaring Roller Inward.
  - If the Duct Face Flange is Under-Formed (Greater than 90°) adjust the Squaring Roller Outward.
  - To make adjustments loosen the Nut under the Duct Face Flange Squaring Roller and then snug to permit movement. Then loosen the Adjustment Screw Lock Nut.
  - Set the Adjustment Screw as required, only make small incremental changes at a time and check for square.
  - Retighten both the Squaring Roller Nut and Adjustment Screw Lock Nut and recheck for square.
  - Repeat as required

**Figure 5.5f**

**(f) Exit Straightener Roller**

- The Exit Straightener Roller is located after the last forming station and above the exiting part. It is designed to remove the bow from the part as it exits the Rollformer. (See Figures 5.5g<sub>1</sub> and 5.5g<sub>2</sub>)
- The Exit Straightener Roller was set prior to leaving the factory and should not require adjustment, however if the part is coming out bowed the Roller may require adjusting.
  - If the part is bowed up adjust the Straightener Roller Downward.
  - If the part is bowed down adjust the Straightener Roller Upward.
  - To make adjustments loosen Exit Straightener Roller Mounting Screw and then snug to permit movement. Then loosen the Adjustment Screw Lock Nut.
  - Set the Adjustment Screw as required, only make small incremental changes at a time and check for bow.
  - Retighten both the Exit Straightener Roller Mounting Screw and Adjustment Screw Lock Nut and recheck for bow.
  - Repeat as required.

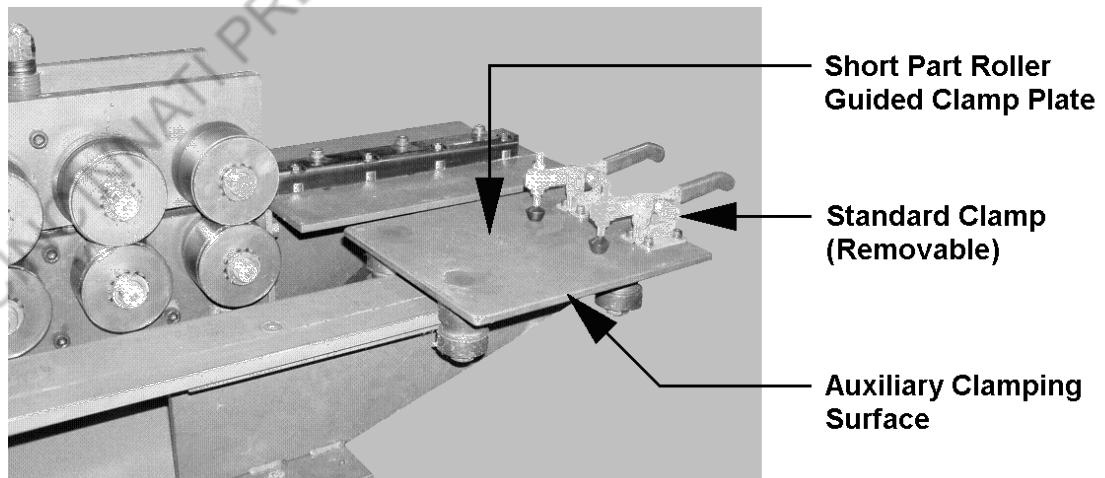
**Figure 5.5g<sub>1</sub>**



**Figure 5.5g<sub>2</sub>**

### 5.7. Short Part Roller Guide Assembly

- A Short Part Roller Guide is included to assist in forming short and/or smaller parts than can normally be hand feed through the Rollformer. See Figures 5.6.
- The Standard Clamps may be used alone or in conjunction with Auxiliary Clamping, such as Vice-Grips or C-Clamps.
- When using the Short Part Roller Guide it is important that the part be clamped up against the Entrance Guide Rollers before starting the part through the Rollformer.



**Figure 5.6**

## 6. Ordering Replacement Parts

### 6.1. Ordering Replacement Machine Parts

Replacement Machine Parts may be ordered directly from Ductformer.

- All of the following information must be provided to insure the correct replacement parts are provided:
  - Machine Model Number
  - Machine Serial Number
  - Replacement Part Number(s)
  - Replacement Part Description(s)
  - Quantity of Parts (each) To Be Placed On Order
- Shipping and Billing Information
  - To Who's Attention
  - Contact Name and Phone Number
  - Company Name
  - Street Address (P.O. Box Address Not Accepted)
  - City, State, Zip Code
  - Preferred Shipping Method

### 6.2. Ordering Replacement and Additional Roll Sets

Additional Roll Sets may be ordered directly from Ductformer.

- All of the following information must be provided to insure the correct Roll Tooling is provided:
  - Machine Model Number
  - Machine Serial Number
  - Roll Tooling Set Number
  - Name / Description of Roll Tooling Set
  - Indicate if a Full Set of Tooling is desired or if only Individual Replacement Rolls are required.
    - Note Individual Replacements by Station Number
    - Station #1 is nearest the Infeed Table and Station #8 is nearest the Exit Table, others are sequentially numbered in-between.
- Shipping and Billing Information
  - To Who's Attention
  - Contact Name and Phone Number
  - Company Name
  - Street Address (P.O. Box Address Not Accepted)
  - City, State, Zip Code
  - Preferred Shipping Method

## 7. Trouble Shooting Guide

Problem	Possible Cause	Possible Solution
Motor Will Not Start	No Power to Rollformer	<ul style="list-style-type: none"> <li>• Connection to Power Source.</li> <li>• Disconnect On</li> <li>• Blown Fuses</li> <li>• Over-Load Protection</li> <li>• Switches &amp; Wiring – See Section 3 Figure 3.0</li> <li>• Burned-Out Motor</li> </ul>
Motor Running and Tooling Rolls Not Turning	Part Jammed In Rollformer	• Roll Tooling for Jams
	Breakage or Blockage In Drive Train	<ul style="list-style-type: none"> <li>• Broken Dive Chain or Sprocket</li> <li>• Broken Keys</li> <li>• Broken Gears</li> <li>• Blockage between Gears</li> </ul>
Unusual Noise	Part Jammed In Rollformer	• Roll Tooling for Jams
	Lack of Lubrication	• Lubrication – See Section 4.1. & 4.2.
	Roll Gap	• See Section 5.4 & 5.5
Part Will Not Feed Through Rollformer or Exits Marred	Material (See Section 5)	<ul style="list-style-type: none"> <li>• Material Too Thick</li> <li>• Material Too Thin</li> </ul>
	Spring Load Adjustment	• See Section 5.2 and 5.3
	Roll Clearance	• See Section 5.4
Material Does Not Track Properly	Roll Clearance s Too Great	• See Section 5.4
Material Edge Run Out	Entrance Guide Not Aligned Properly	• See Figure 5.1 and Specific Infeed Guide Settings in Section 5
TDFC Hem Length - Not Consistent	Entrance Guide Not Aligned Properly	• See Section 5.6a



<b>Problem</b>	<b>Possible Cause</b>	<b>Possible Solution</b>
TDFC Outer Flange - Not Square (Not 90°)	Roller in Station 8 Out of Adjustment	<ul style="list-style-type: none"><li>• See Section 5.6b</li></ul>
TDFC Inside Flange – Inside Radius Too Large and/or Not Square	Rollers in Stations 12 and 13 Out of Adjustment	<ul style="list-style-type: none"><li>• See Section 5.6c</li></ul>
TDFC Duct Face Flange – Not Square (Not 90°)	Hold-Down Rollers (Stilson Rollers) Out of Adjustment	<ul style="list-style-type: none"><li>• See Section 5.6d</li></ul>
TDFC Part - Bowed	Duct Face Flange Roller Out of Adjustment	<ul style="list-style-type: none"><li>• See Section 5.6e</li></ul>
	Exit Straightener Out of Adjustment	<ul style="list-style-type: none"><li>• See Section 5.6f</li></ul>

Notes:

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