

NUCOR BUILDING SYSTEMS

CFR™

SEAMING MANUAL

FOR FIELD USE

PLEASE DISTRIBUTE TO THE ERECTION CREW

WATERLOO, IN
 305 Industrial Parkway
 Waterloo, IN 46793
 Phone: 260-837-7891
 Fax: 260-837-7384

SWANSEA, SC
 200 Whetstone Road
 Swansea, SC 29160
 Phone: 803-568-2100
 Fax: 803-568-2121

TERRELL, TX
 600 Apache Trail
 Terrell, TX 75160
 Phone: 972-524-5407
 Fax: 972-524-5417

LANCASTER, PA
 210 Granite Run Dr.
 Suite 280
 Lancaster, PA 17601
 Phone: 717-735-7766
 Fax: 717-735-7769

BRIGHAM CITY, UT
 1050 North Watery Lane
 Brigham City, UT 84302
 Phone: 435-919-3100
 Fax: 435-919-3101

DUE TO THE PROCESS OF CONTINUOUS IMPROVEMENT, THE PRODUCTS AND PROCEDURES IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE

MANUAL REVISION INFORMATION			
ACTIVITY	ADDENDUM RELEASE #	PAGES REVISED	RELEASE DATE
Most Recent	#4	Entire Manual	10/5/2010
Previous Revisions	#3	1	9/ /2009
	#2	1,4,6,26,28	8/7/2009

TABLE OF CONTENTS

1.0 TABLE OF CONTENTS

1.0 TABLE OF CONTENTS 2

1.0 GENERAL 4

1.1 Purpose of this Manual 4

1.2 Buyer’s responsibility 4

1.3 MBMA 4

1.4 Disclaimer 4

1.5 Receiving and Shipping 4

1.6 Handling and Storage 5

1.7 Insurance 5

1.8 Power Supply 5

1.9 Electrical Service and Cords 5

1.10 Electrical Safety and Cord Clearance 5

1.11 Roof Performance 5

2.0 SEAMING KIT 6

2.1 Specialized Seaming Tools 6

2.2 Seaming Tool Source 6

2.3 Seaming Kit 6

3.0 IMPORTANCE OF SEAMING 8

3.1 When to Seam 8

3.2 Temporary Seaming 8

4 SEAM TYPES 10

4.1 General 10

4.2 “Nucor Roll Lock”™ Seam 10

4.3 “Nucor Vise Lock”™ Seam 10

4.4 “Nucor Vise Lock 360”™ Seam 10

4.5 Seam Option Details 11

5 ASSEMBLY 12

5.1 Side Lap Fit-Up 12

5.2 Clip Alignment 12

5.3 Seam Damage 12

6 MANUAL CRIMPING TOOL OPERATION FOR “NUCOR VISE LOCK”™ SEAM 13

6.1 Manual Crimping Tool Nomenclature 13

6.2 Assemble the Seaming Tool 13

6.3 Tool Orientation to Seam 13

6.4 Forming the Seam 14

6.5 Tool position at the End of the Roof Panel 15

6.6 Tool position at an End Lap 16

6.7 Tool position at Panel Clips 17

6.8 Checking the Finished Seam 17

7 BEFORE OPERATING THE MOTORIZED SEAMING MACHINE 18

7.1 Seaming Machine Nomenclature 18

7.2 Single Direction “Nucor Vise Lock”™ “ 18

7.3 Bi-directional Seamer Machine 19

7.4 Cleaning the Seams 19

7.5 Starting Seams 19

7.6 Single Direction “Nucor Vise Lock 360”™ 20

8 MOTORIZED SEAMING MACHINE 21

TABLE OF CONTENTS

8.1 Machine Orientation to the Seam (Single Directional) 21

8.2 Machine Position on the Roof Panel 21

8.3 Machine Orientation to the Seam (Bi-Directional) 22

8.3 22

8.4 Rotating The Bi-directional Seamer 23

8.5 Machine Position on the Roof Panel 24

8.6 Running the Machine 25

8.7 Unlocking the Machine 25

8.8 Stopping the Machine 25

8.9 Checking the Finished Seam 25

9 “NUCOR ROLL LOCK”™ SEAMING DETAILS 26

9.1 Manual Seaming 26

9.2 Finished Seam Detail 26

10 “NUCOR VISE LOCK”™ SEAMING DETAILS 27

10.1 Manual Seaming 27

10.2 Motor Seaming 27

10.3 Finished Seam Detail 27

11 MANUAL CRIMPING TOOL OPERATION FOR “NUCOR VISE LOCK 360”™ 28

11.1 Tool Orientation to Seam 28

12 “NUCOR VISE LOCK 360”™ SEAMING DETAILS 29

12.1 Prior Seaming 29

12.2 Locking Seamer on Panel 29

12.3 Motor Seaming 29

12.4 Finished Seam Detail 29

13 MOTORIZED SEAMING MACHINE MAINTENANCE 30

13.1 General 30

13.2 Seaming Rolls 30

13.3 Cooling Vents 30

13.0 SEAMER TROUBLESHOOTING GUIDE 31

1.0**GENERAL****1.0 GENERAL****1.1 PURPOSE OF THIS MANUAL**

This installation manual is provided to Nucor Builders and their erectors as the recommended procedure for the correct seaming of the Nucor Building Systems (NBS) "CFR"[™] Roof System.

This manual is intended to be used in conjunction with the "CFR"[™] Erection Manual and the project's erection drawings to help plan and organize the installation of the NBS "CFR"[™] Roof System. The erection drawings govern specific seam requirements. **In the case of conflict between this manual and the erection drawings, the erection drawings will take precedence.**

1.2 BUYER'S RESPONSIBILITY

The buyer must take the responsibility for selecting a competent erector, insist that the work be performed by qualified and experienced standing seam metal roof installers, insist that the erector take time to study and understand this manual, then assure that the erector correctly follows the manual's instructions.

NBS does not guarantee and is not liable for the quality of erection. NBS is not responsible for building defects that may be attributed to improper erection or the negligence of other parties.

Clarification concerning the NBS "CFR"[™] roof installation and seaming should be directed to the **QUALITY SERVICE REPRESENTATIVE** or the Customer Service Manager at the NBS plant. The following is a list of addresses and phone numbers for the Quality Service Representative at each NBS division:

WATERLOO, IN

305 Industrial Parkway
Waterloo, IN 46793
Phone: 260-837-7891
Fax: 260-837-7384

SWANSEA, SC

200 Whetstone Road
Swansea, SC 29160
Phone: 803-568-2100
Fax: 803-568-2121

TERRELL, TX

600 Apache Trail
Terrell, TX 75160
Phone: 972-524-5407
Fax: 972-524-5417

LANCASTER, PA

210 Granite Run Dr.
Suite 280
Lancaster, PA 17601
Phone: 717-735-7766
Fax: 717-735-7769

BRIGHAM CITY, UT

1050 North Watery Lane
Brigham City, UT 84302
Phone: 435-919-3100
Fax: 435-919-3101

1.3 MBMA

This building is designed, manufactured, and delivered in accordance with the **2006 M.B.M.A. METAL BUILDING SYSTEMS MANUAL. CONSULT THE INFORMATION IN THE "COMMON INDUSTRY PRACTICES" SECTION.**

1.4 DISCLAIMER

THE PRODUCTS AND PROCEDURES IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE

1.5 RECEIVING AND SHIPPING

Upon receipt of the seaming kit, and before the signing the shipping receipt, check and verify that the seaming kit is received in good condition, without damage or loss of contents. **See section 2.0 for a list of kit contents.**

If there is damage or loss of contents, immediately file the claim with the shipper and notify NBS for replacement instructions.

Upon completion of roof seaming, promptly return the seaming kit to NBS, in accordance with the instructions on the return shipping documents. The return shipping documents are included in the seaming kit.

1.0 GENERAL**1.6 HANDLING AND STORAGE**

Provide safe and secure handling of the seaming tools when in use.

The Motorized Seaming Machine weighs 65lbs., and can cause severe damage and injury if it falls.

The machine is too heavy to safely carry up a ladder. Always hoist the machine onto the roof with proper lifting equipment and securely tied to the machine's front lifting handle.

When starting and stopping the seaming machine at the edges of the roof, the operator must be securely positioned so they can safely lift the machine on and off of the seam.

CAUTION: When running the machine in the downslope direction, the machine will have greater downhill inertia and coasting distance.

When not locked to the seam, the Motorized Seaming Machine can freely roll on its wheels. Always secure the machine to prevent it from rolling or sliding off of the roof.

When the seaming tools are not in use, they must be stored in the seaming kit chest and in a safe and dry area. The seaming tools must be cleaned and dried before storing.

1.7 INSURANCE

The NBS "CFR"™ seaming tools are custom built specialized equipment and are costly to replace. Provide adequate insurance coverage on the seaming tools while they are in your possession.

1.8 POWER SUPPLY

The seaming machine motor requires a minimum electrical power supply of: 20 amp @ 120 volt @ 60 hz. AC.

1.9 ELECTRICAL SERVICE AND CORDS

The electrical service and cords to the seaming machine must be of sufficient capacity to provide the full 20 amp @ 120 volts. **AT THE SEAMING MACHINE.** If other tools or equipment are being used on the same service, the service and cord capacity must be increased accordingly

IMPORTANT NOTE: LOW VOLTAGE DUE TO INSUFFICIENT SERVICE CAPACITY, INSUFFICIENT CORD SIZE OR EXCESSIVE CORD LENGTH WILL CAUSE OVERHEATING AND BURNOUT OF THE SEAMING MACHINE'S MOTOR.

1.10 ELECTRICAL SAFETY AND CORD CLEARANCE

Check that the power cords are fitted with the correct plug for safe and secure connection to the seaming machine. Check that the power cords are properly grounded and that the service has a ground fault circuit breaker.

Check that the electrical cord is of sufficient length to extend the full length of the area to be seamed, without stress on the cord or it's connections. Check that the path for the cord is clear and that the cord is clear of snagging on panel edges or entanglement onto the seaming machine rolls.

1.11 ROOF PERFORMANCE

The roof panels must be correctly installed and seamed before the roof system can provide it's designed wind load and weather resistance capability. This means that an un-seamed roof is subject to wind load failure and weather resistance failure. **The erector shall be responsible to ensure that the proper seaming method is followed (Either "Nucor Roll Lock"™, "Nucor Vise Lock"™, or "Nucor Vise Lock 360"™).**

2.0 SEAMING KIT

2.0 SEAMING KIT

2.1 SPECIALIZED SEAMING TOOLS

The seaming of the NBS “CFR”™ roof panels requires special seaming tools that are available only from NBS.

CAUTION: THE USE OF ANY OTHER SEAMING EQUIPMENT WILL RESULT IN FAULTY AND/OR DAMAGED SEAMS AND SHALL INVALIDATE THE ROOF SYSTEM’S MATERIAL AND WEATHERTIGHTNESS WARRANTIES.

2.2 SEAMING TOOL SOURCE

The seaming tools are provided by NBS in accordance with the terms and conditions of the NBS contract documents. Contact the NBS Customer Service Department to arrange the scheduling, delivery and return of the seaming tools.



Shipping Container



Manual Hand Crimper

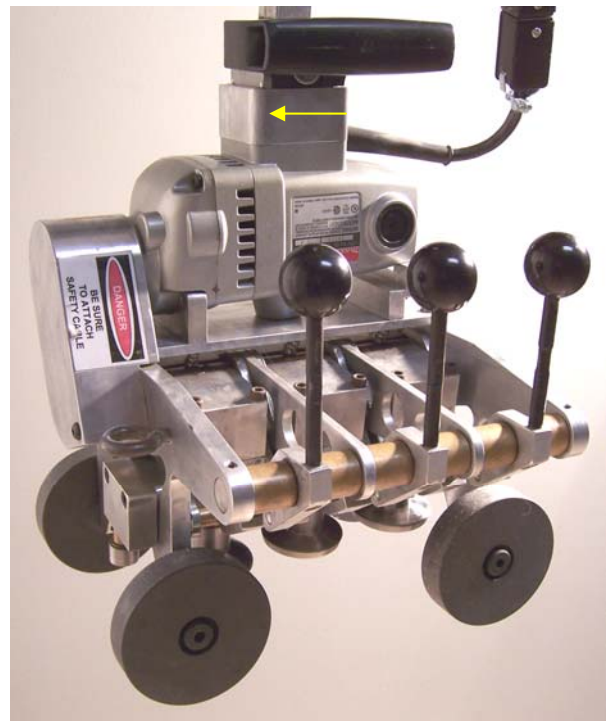


360 Hand Crimper

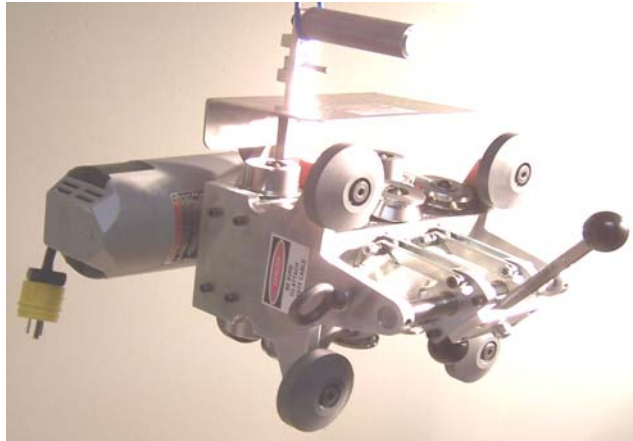
2.3 SEAMING KIT

The seaming equipment will normally be provided as a seaming kit. The seaming kit will include the following:

- a. Seaming Kit Chest (contains and protects the seaming tools during shipment and storage).
- b. Manual Crimping Tool
- c. Motorized Seaming Machine (provided only for “Nucor Vise Lock”™ or “Nucor Vise Lock 360”™ seaming applications).
- d. Seaming Instructions Manual
- e. Return Shipping Documents
- f. Misc. Wrenches
- g. Replacement fiber backer rollers and cam rollers



Single Directional Motorized Seaming Machine – For Painted or Galvalume Roofs Produces a Vise Lock Seam

Seaming Kit Con't

**Bi- Directional Motorized Seaming
Machine – For Galvalume Roofs
Produces a “Nucor Vise Lock”™ Seam**



**Single Directional Motorized Seaming
Machine – For Galvalume & Painted Roofs
Produces a “Nucor Vise Lock 360”™ Seam**

3.0 IMPORTANCE OF SEAMING**3.0 IMPORTANCE OF SEAMING****3.1 WHEN TO SEAM**

Whenever possible, the installed roof panels should be seamed at the completion of each day's work. If high winds or rain/snow conditions are imminent, the installed roof panels must be seamed before such conditions occur.

Refer to the project erection drawing **ROOF SHEETING PLAN(S)** and/or **DETAIL PAGE(S)** to determine what seaming option is required. The detail below is a copy of the detail that will appear on the erection drawings. **NOTE:** This detail conveys the **MINIMUM** seaming requirements based on the design of the project. Additional seaming may be necessary as specified by the builder. **ALSO NOTE: Multiple seaming types may be required on a project. Review the Roof Sheeting Plan(s) and Detail(s) carefully. Multiple seam types means that you would have two different seamers each producing a different seam profile. SEE page 10 defining seam types.**

3.2 TEMPORARY SEAMING

On roofs requiring “Nucor Vise Lock”™ or “Nucor Vise Lock 360”™ seams, it may not always be practical or feasible to motor seam the roof panels until after the roof installation is completed. Motor seamed roof panels are difficult to reposition or replace. Motorized Seaming Machines may not always be available during the entire roof installation period.

In such cases, it may be desirable to temporarily “Nucor Roll Lock”™ seam the roof panels with the manual seaming tool. Then, later complete the seaming with the Motorized Seaming Machine.

IMPORTANT: It shall be the erector's responsibility to apply the “Nucor Roll Lock”™ seaming method in such a way as to ensure that the panels have been adequately secured until the motor seaming can occur.

3.0 IMPORTANCE OF SEAMING

CFR SEAMING REQUIREMENTS

THE DESIGN OF THIS STRUCTURE REQUIRES THAT THE FOLLOWING SEAMING METHOD BE UTILIZED AS A MINIMUM:

- 1) "NUCOR ROLL LOCK"™ SEAM (SEE NOTE 1 AND 2 BELOW)
- 2) "NUCOR VISE LOCK"™ SEAM (SEE NOTE 1 AND 2 BELOW)
- 3) "NUCOR VISE LOCK 360"™ SEAM (SEE NOTE 2 AND 3 BELOW)

NOTE 1: ADDITIONAL SEAMING MAY BE NECESSARY AS SPECIFIED BY THE BUILDER.

NOTE 2: MULTIPLE SEAMING TYPES MAY BE REQUIRED. REVIEW THE ROOF SHEETING PLAN CAREFULLY FOR SEAMING REQUIREMENTS. MULTIPLE SEAM TYPES MEANS THAT YOU WOULD HAVE TWO DIFFERENT SEAMERS, EACH PRODUCING A DIFFERENT SEAM PROFILE.

NOTE 3: NOT ALL ROOF SYSTEMS REQUIRE MECHANICAL SEAMING. THE BUYER, OWNER, OR ARCHITECT MAY ELECT TO SPECIFY A MECHANICALLY SEAMED PANEL. OFTEN, FACTORY MUTUAL RATINGS ALSO REQUIRE A SECOND PASS MECHANICAL SEAMER. SEE IMPORTANT ERECTOR NOTE BELOW ON "NUCOR VISE LOCK 360"™ SEAMER REQUIREMENTS.

IMPORTANT "Nucor Vise Lock 360"™ seamer Note:

In order to achieve a good VL360 seam, the erector must have first successfully seamed the roof with the primary seamer ("Nucor Vise Lock").™ Before running the VL360 seamer, the erector needs to hand crimp the "Nucor Vise Lock"™ seam into the VL360 seam. See the CFR seamer erection manual for your specific hand crimping application.

SSSM0015

4.0 SEAM TYPES**4 SEAM TYPES****4.1 GENERAL**

The NBS "CFR"™ roof system has three seam type options. The project design and performance requirements govern which seam type is required.

Different seam types may be required on specific areas of the roof. In all cases, refer to the erection drawings to determine the required seam type and locations.

4.2 "NUCOR ROLL LOCK"™ SEAM

The "Nucor Roll Lock"™ seam requires the roof panels be seamed with the manual seaming tool only at the panel clips, the eave, the high side of the roof panels, and at the end laps.

The Motorized Seaming Machine is not required for "Nucor Roll Lock"™ seaming

4.3 "NUCOR VISE LOCK"™ SEAM

The "Nucor Vise Lock"™ seam requires seaming the roof panel with the manual seaming

tool at the starting eave or ridge end of the panels, and at the end laps. Then seaming the full length of the roof panels with the Motorized Seaming Machine.

4.4 "NUCOR VISE LOCK 360"™ SEAM

The "Nucor Vise Lock 360"™ seam **requires** that the roof panels be **previously** "Nucor Vise Lock"™ seamed. Then over-seaming the full length of the roof panels with the Motorized Seaming Machine.

To Start the "Nucor Vise Lock 360"™ seamer, the previously Vise Locked panel seam will need to be manually crimped with the 360 roof crimper. See **page 27** for instructions.

The "Nucor Vise Lock 360"™ seam will utilize two seaming tools. The **Primary** seaming tool will form the "**Nucor Vise Lock**"™ seam and the **Secondary** seaming tool will form the "**Nucor Vise Lock 360**"™.

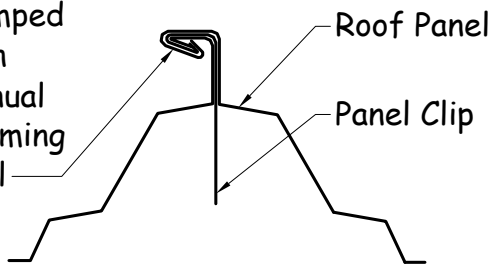
SEE THE FOLLOWING PAGE FOR DETAILS OF ALL THREE SEAM TYPES

4.0 SEAM TYPES

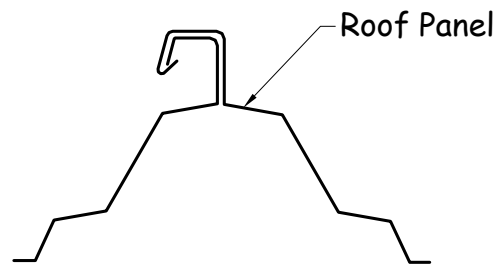
4.5 SEAM OPTION DETAILS

"NUCOR ROLL LOCK"TM SEAM

Crimped with
Manual
Seaming
Tool



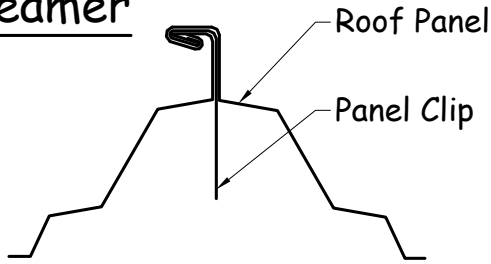
At Panel Clips & Panel Ends



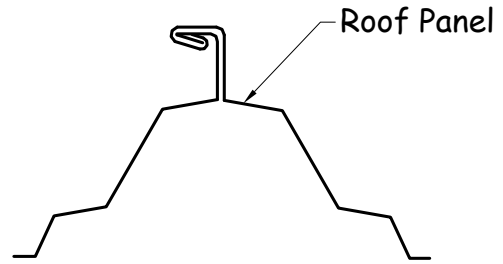
Between Panel Clips & Panel Ends

"NUCOR VISE LOCK"TM SEAM - Primary

Seamer



At Panel Clips

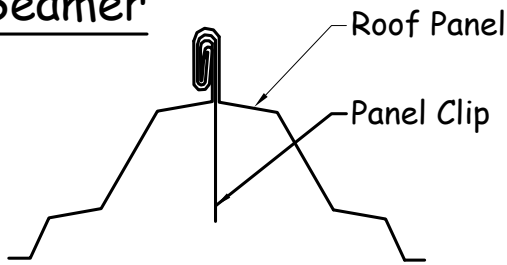


Between Panel Clips

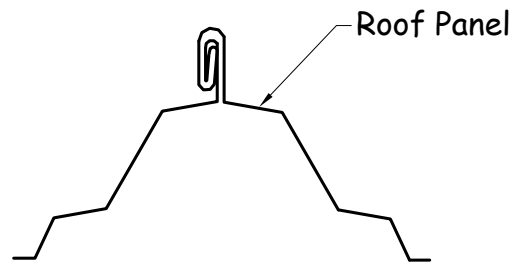
Bi-directional seamer available for Galvalume roofs, this seam option only.

"NUCOR VISE LOCK 360"TM SEAM - Secondary

Seamer



At Panel Clips



Between Panel Clips

5.0 CHECK PANEL ASSEMBLY

5 ASSEMBLY

5.1 SIDE LAP FIT-UP

Before seaming, inspect the full length of each roof panel side lap. Check that the lip at the panel’s male edge is enclosed by the hook of the adjacent panel’s female edge. Refer to the detail below.

Any conditions where the male lip is not positioned inside of the female hook must be corrected before attempting to seam the roof panels.

CAUTION: False seaming may occur where the female lip does not hook the roof panel’s male edge. False seamed roof panels cannot provide their designed load and weather resistance.

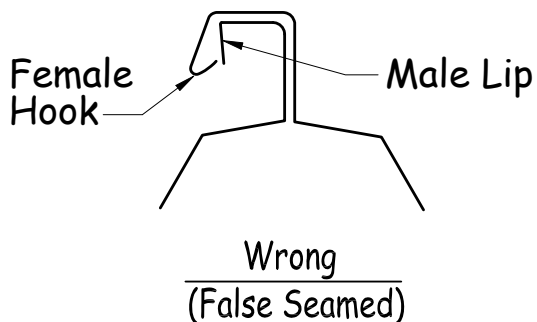
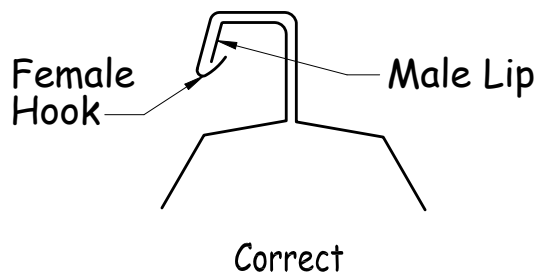
5.2 CLIP ALIGNMENT

Before seaming, check that each roof panel clip is properly seated in the roof side lap assembly. Any displaced clips must be corrected before attempting to seam the roof panels.

CAUTION: Panel clips that are not properly aligned can cause faulty seaming and objectionable seam appearance.

5.3 SEAM DAMAGE

Before seaming, check that the male and female edges do not have kinks or other distortions. Any such distortions must be corrected before attempting to seam the roof panels.



6.0 MANUAL CRIMPING TOOL OPERATION

6 MANUAL CRIMPING TOOL OPERATION FOR “NUCOR VISE LOCK”™ SEAM

6.1 MANUAL CRIMPING TOOL NOMENCLATURE

Detail “A” below identifies the operational parts of the manual crimping tool.

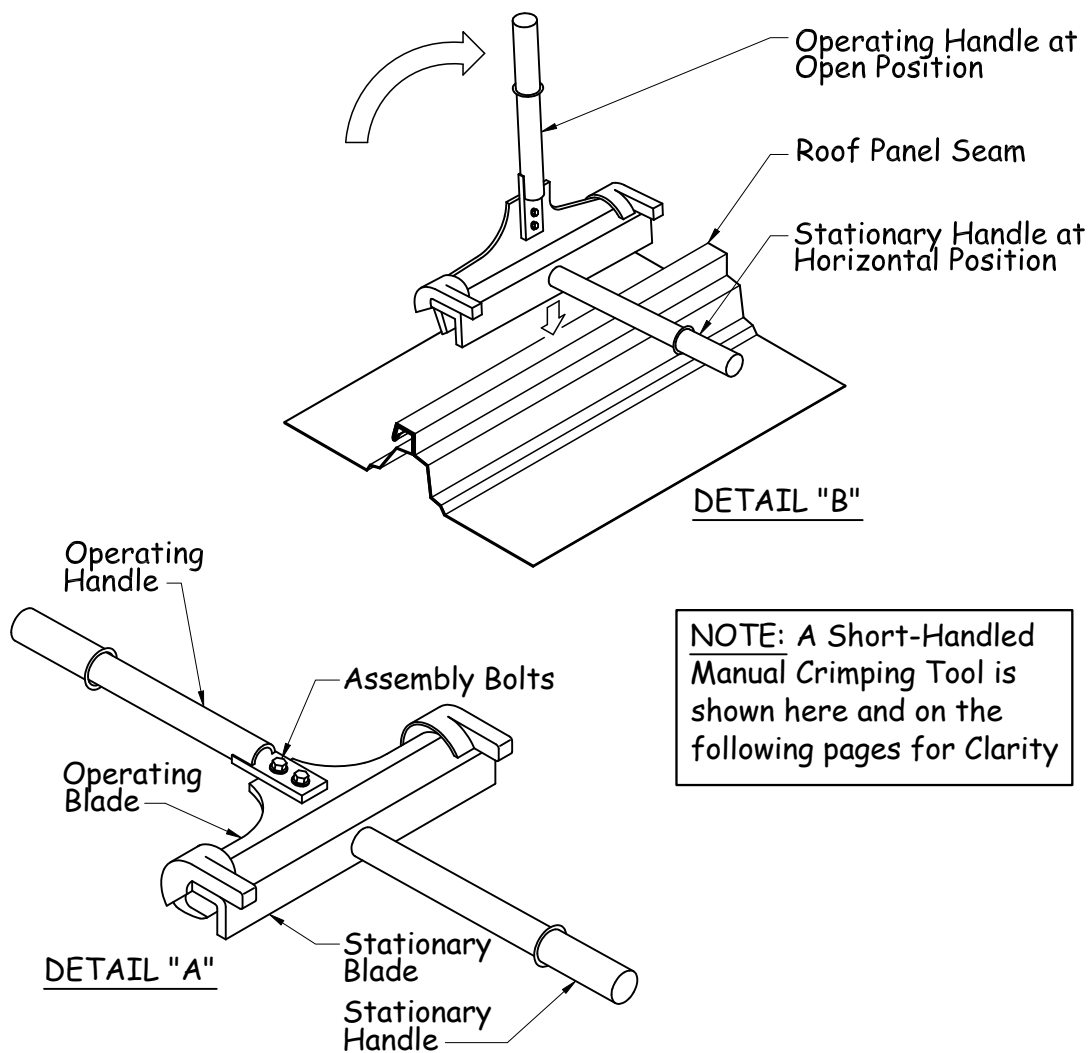
This hand crimper manually forms the “Nucor Vise Lock”™ seam.

6.2 ASSEMBLE THE SEAMING TOOL

When received, the manual crimping tool may be disassembled. Assemble the handle to the tool body with the provided bolts.

6.3 TOOL ORIENTATION TO SEAM

Orient the tool to fit correctly onto the roof panel seam as shown in **Detail “B”** below. The stationary handle must be in the horizontal position and the operating handle must be rotated up to the open position.

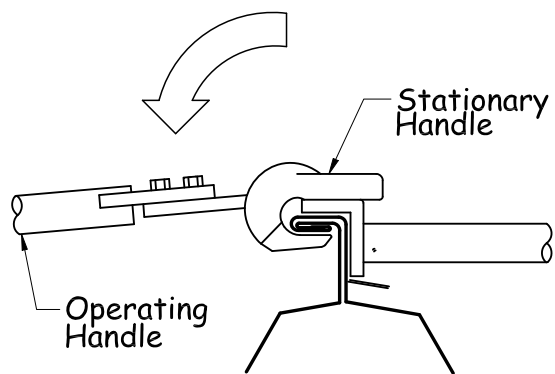
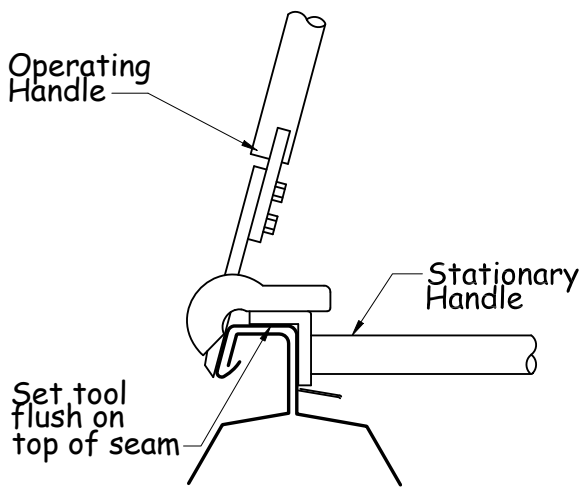
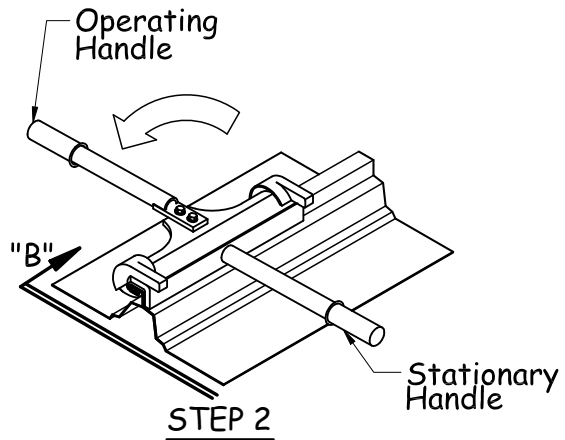
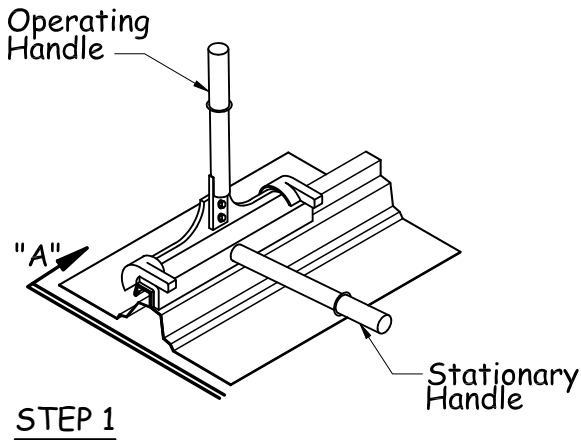


6.0 MANUAL CRIMPING TOOL OPERATION

6.4 FORMING THE SEAM

When the tool is correctly positioned on the panel, push the stationary blade solidly against the top of the seam.

While holding the stationary handle in the horizontal position, rotate the operating handle down to the horizontal position. This will form the seam.



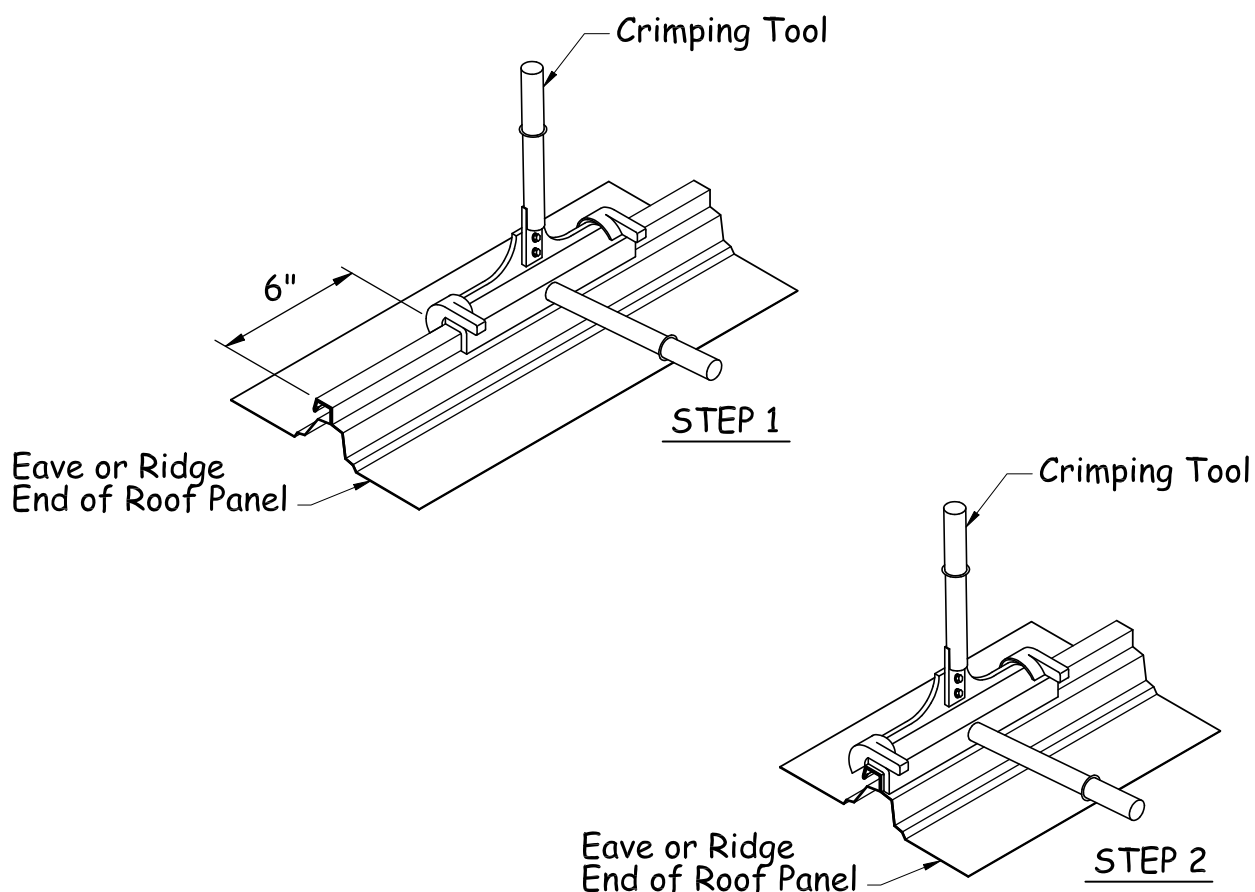
6.0 MANUAL CRIMPING TOOL OPERATION

6.5 TOOL POSITION AT THE END OF THE ROOF PANEL

When seaming at the eave or ridge end of the roof panel, the seaming must be done in two steps.

STEP 1: Position the end of the crimping tool 6" from the end of the roof panel and seam that area.

STEP 2: Position the end of the crimping tool flush with the end of the roof panel and seam that area.



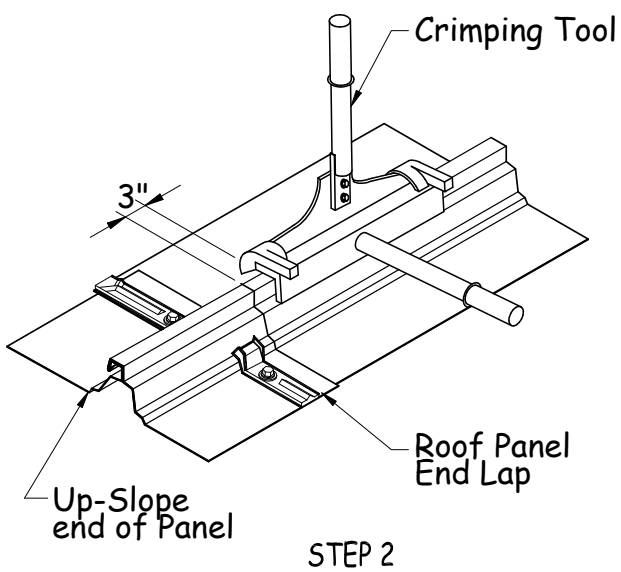
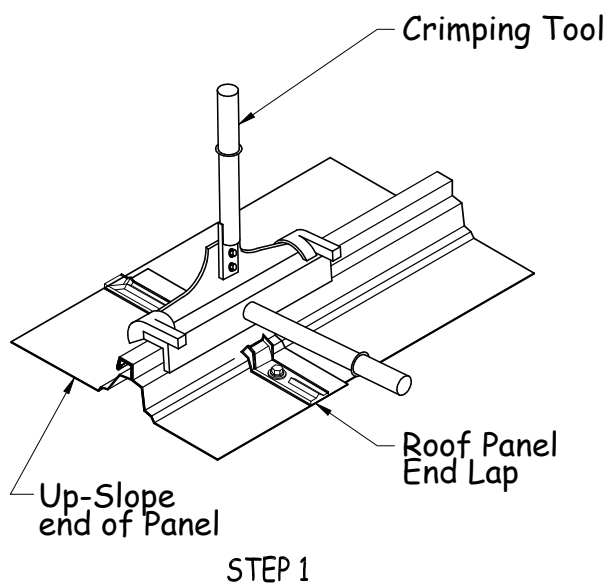
6.0 MANUAL CRIMPING TOOL OPERATION

6.6 TOOL POSITION AT AN END LAP

When seaming at a roof panel end lap, the seaming must be done in two steps.

STEP 1: Center the manual crimping tool over the end lap and seam that area.

STEP 2: Position the end of the crimping tool 3” from the edge of the end lap and seam that area to ensure that the panel clip at this location is also crimped.



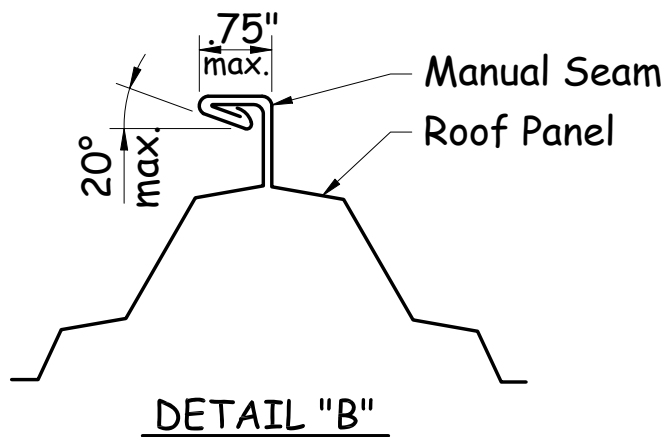
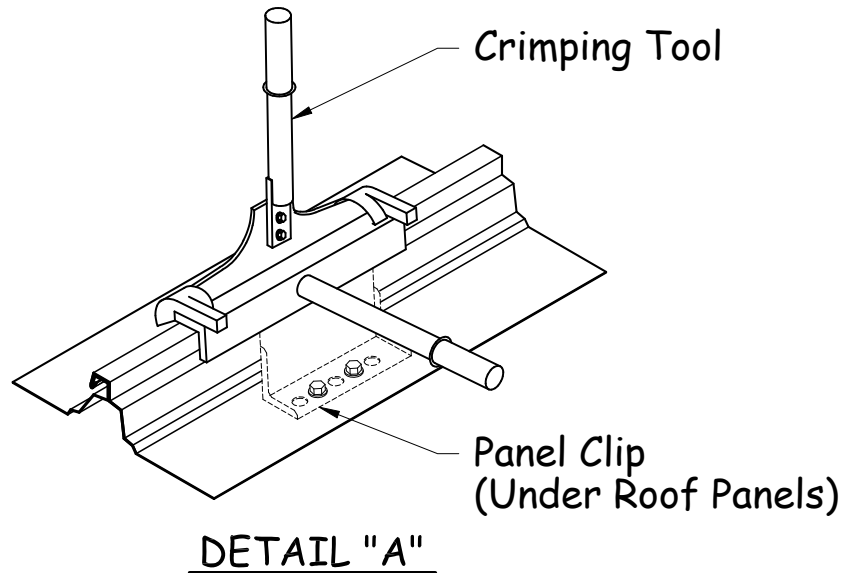
6.0 | **MANUAL CRIMPING TOOL OPERATION**

6.7 | **TOOL POSITION AT PANEL CLIPS**

When seaming at a panel clip location, center the tool over the panel clip and seam that area. See **Detail "A"** below.

6.8 | **CHECKING THE FINISHED SEAM**

Rotate the operating handle to the open position, remove the tool and check that the seam is correctly formed, as shown in **Detail "B"** below.



7.0 | MOTORIZED SEAMING MACHINE

**7 BEFORE OPERATING THE
MOTORIZED SEAMING
MACHINE**

**7.1 SEAMING MACHINE
NOMENCLATURE**

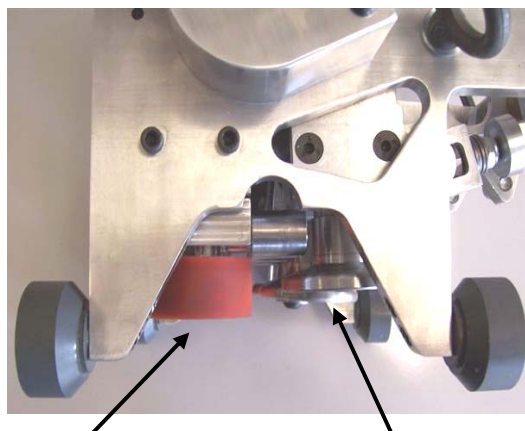
The following details identify the operational parts of the Single Direction Motorized Seaming Machine. Seaming tools may have variations from the tools shown in this manual



**ON/OFF Switch
@ Top of Handle**

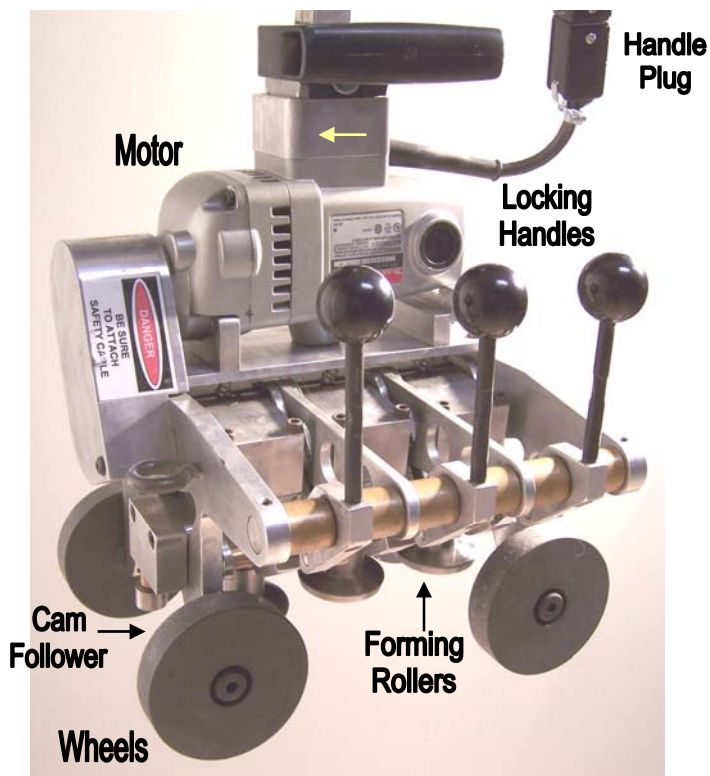
**7.2 SINGLE DIRECTION “NUCOR VISE
LOCK”™**

The “Nucor Vise Lock”™ seam requires a three station single direction Motorized Seaming Tool. It should be clearly labeled “Primary” on the tool with arrows indicating the direction of travel.



Backer Rolls Forming Rolls

IF excessive picking of the paint or Galvalume coating is occurring, then discontinue seaming and consult with your NBS quality service representative. Failure to contact NBS MAY void your roof warranty.



**Primary Seamer
Produces a "Vise Lock" Seam
PAGE 18**

7.0 | MOTORIZED SEAMING MACHINE

7.3 BI-DIRECTIONAL SEAMER MACHINE

The Bi-Directional seamer is only used on Galvalume Vise Locked roof panels.

This seaming machine has two sets of forming rollers on one machine. This tool can be started at the peak or the eave. Arrows indicate the direction of travel. Once the seamer machine has finished power locking a seam, un-lock the machine from the seam, then pull up on the release trigger pin located under the handle, rotate the machine, the machine trigger pin will lock in position once the machine has been rotated. Next lock the seamer on the next seam adjacent to the one that was just finished. **MAKE SURE THAT THE SEAMER ARROW POINTS IN THE DIRECTION OF THE PANEL THAT IS TO BE SEAMED.** Double check that the rolls are properly placed on the panel as shown in section 8.5 Seam panel and then repeat the prior steps on the next seam.

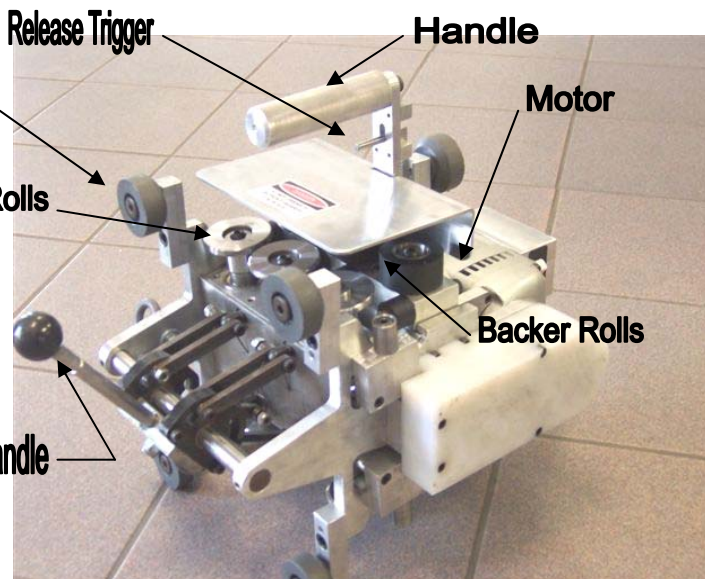
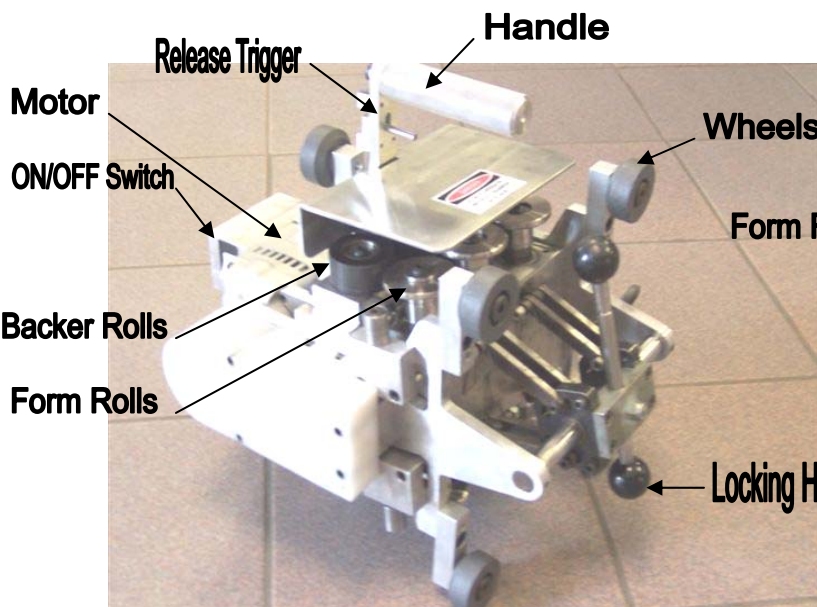
7.4 CLEANING THE SEAMS

The roof panel seams must be thoroughly cleaned of abrasive dirt or dust that can cause scuffing or scratching of the seam surface. The roof panel seams must be cleaned of grease and all other contaminants that can cause seaming machine slippage and marking of the seam surface.

7.5 STARTING SEAMS

For the “Nucor Vise Lock”™ seaming, the seaming machine must start on a portion of the seam that has already been crimped with the manual crimping tool. Depending on which direction the seaming machine will be run, form the starting seam at the eave or ridge end of the panels with the manual seaming tool as described previously in section 6.5.

IF excessive picking of the paint or Galvalume coating is occurring, then discontinue seaming and consult with your NBS quality service representative. Failure to contact NBS MAY void your roof warranty.

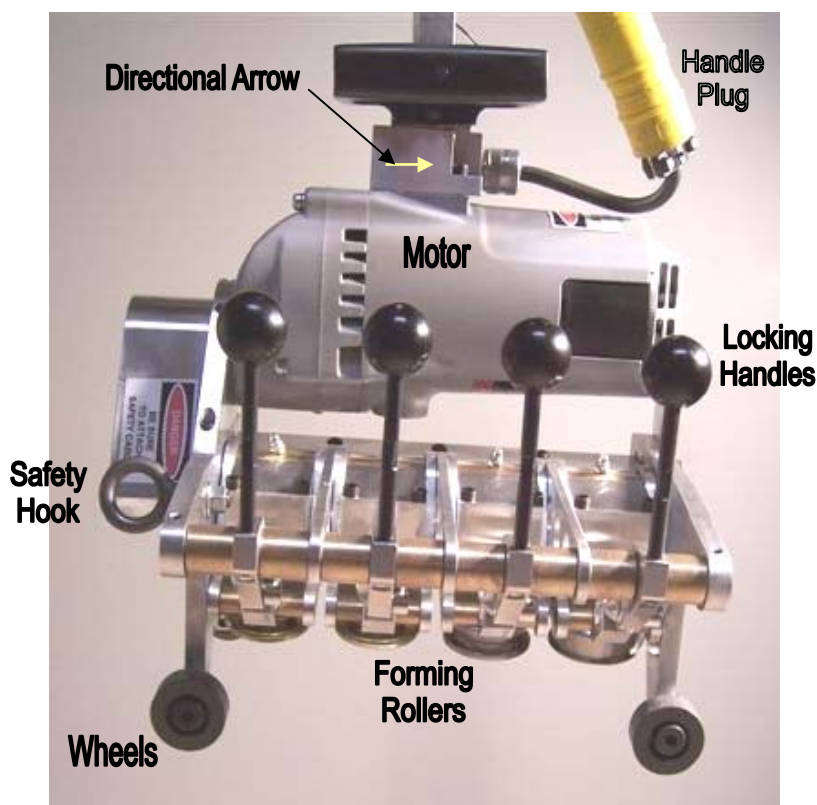


**Bi- Directional Motorized Seaming Machine –
For Galvalume Roofs
Produces a “Nucor Vise Lock”™ Seam**

7.0 | MOTORIZED SEAMING MACHINE**7.6 | SINGLE DIRECTION "NUCOR VISE
LOCK 360"™**

The "Nucor Vise Lock 360"™ seam requires one three station and one four station single direction Motorized Seaming Tool. These tools will be clearly labeled "**Primary**" and "**Secondary**" with arrows indicating the direction of travel. **The Primary seaming tool must be run on all panels before the Secondary seaming tool is operated.**

Secondary Seamer



**Single Directional Motorized Seaming
Machine – For Galvalume
Produces a "Nucor Vise Lock 360"™ Seam**

8.0 | MOTORIZED SEAMING MACHINE

8 MOTORIZED SEAMING MACHINE

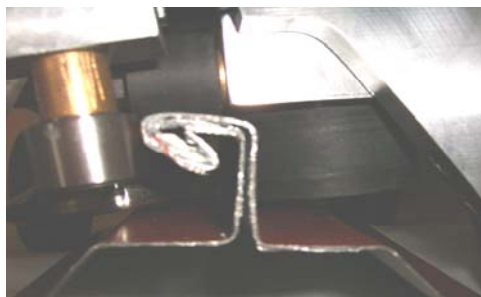
8.1 MACHINE ORIENTATION TO THE SEAM (SINGLE DIRECTIONAL)

On roofs sheeted from left to right, the seaming machine will run from the eave to the ridge. On roofs sheeted from right to left, the seaming machine will run from ridge to eave.

8.2 MACHINE POSITION ON THE ROOF PANEL

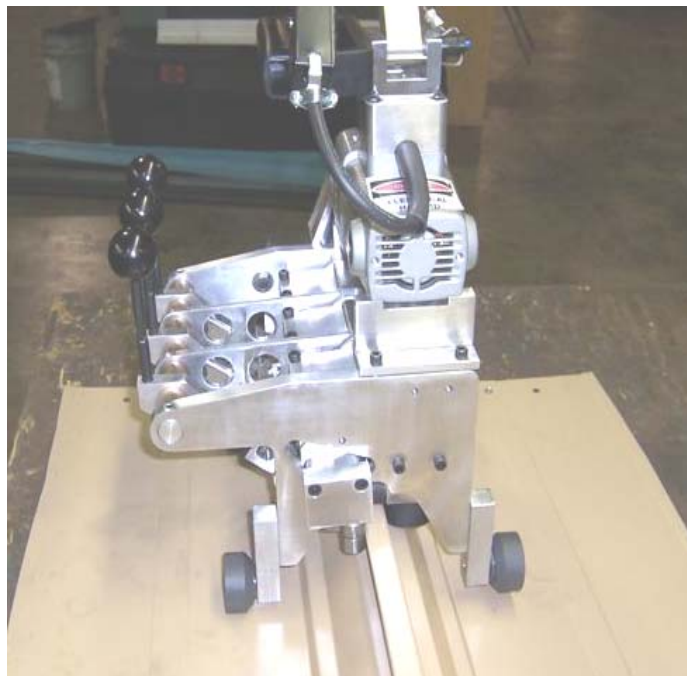
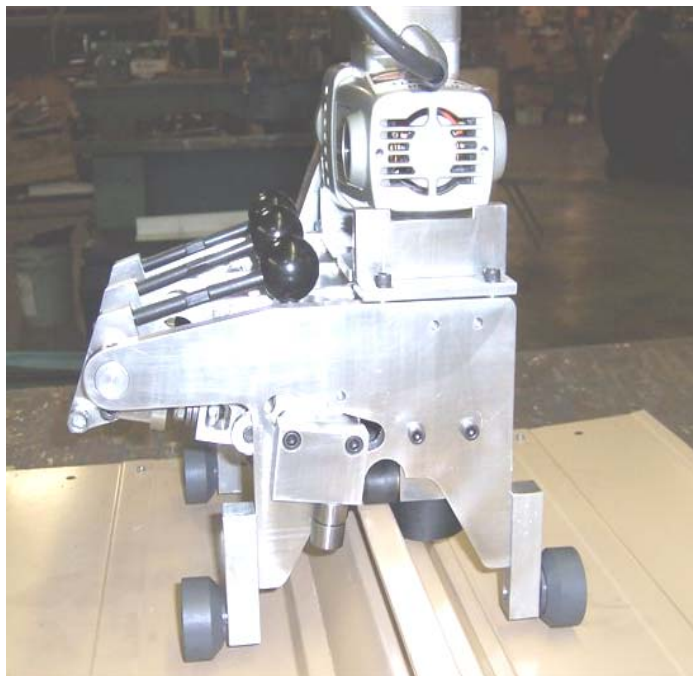
With the locking handles down in the open position, set the seaming machine onto the starting end of the roof panel's seam, over the manually seamed portion of the seam.

Roll the seaming machine forward to align the front seaming rolls over the unseamed portion of the seam, as shown in the details below.



**Unlocked
Handles Down**

**Locked
Handles Up**



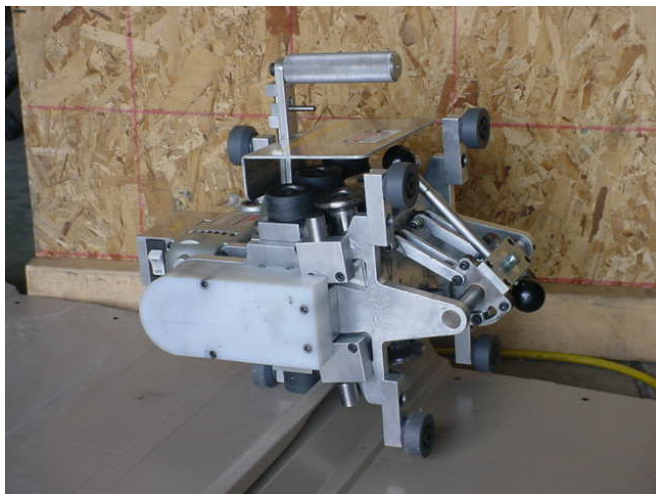
8.0 | MOTORIZED SEAMING MACHINE

8.3 MACHINE ORIENTATION TO THE SEAM (BI-DIRECTIONAL)

This seamer produces a “Nucor Vise Lock”™ seam in both directions. When using the Bi-directional seamer on Galvalume roofs, it doesn’t matter which direction that the roof was sheeted. The seamer will run from eave to ridge OR ridge to eave. Basically, you run the seamer up one seam, release the trigger pin next to the

handle, rotate the machine, then place it on the adjacent un-seamed seam and run the seamer back.

Seaming Direction is indicated by arrow on motor.



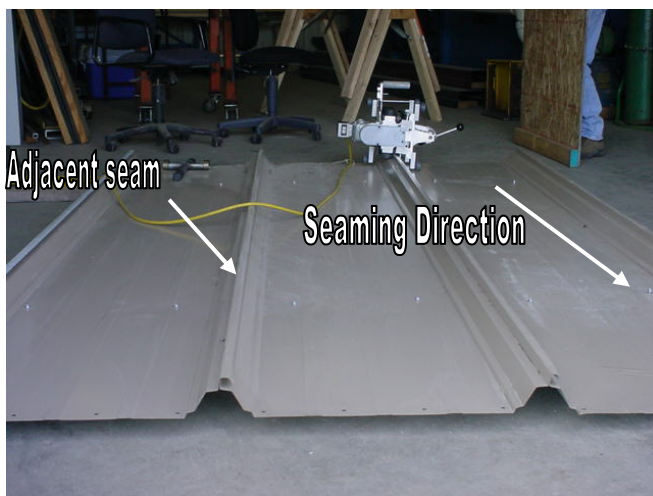
Step #1

With the locking handle held up in the open position, set the seaming machine onto the starting end of the roof panel's seam, over the manually seamed portion of the seam.



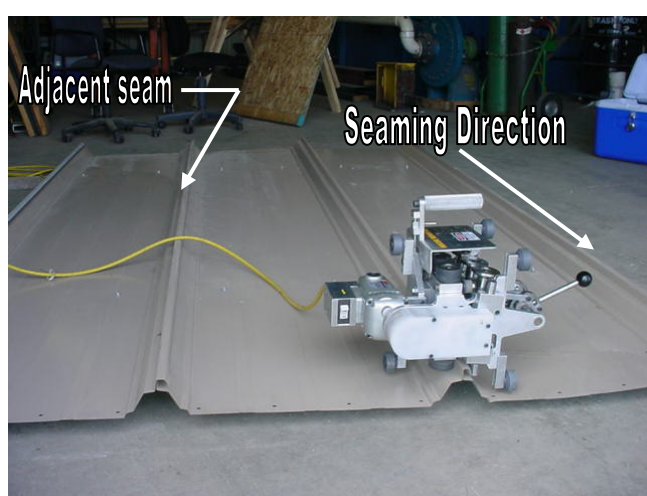
Step #2

Lock the seamer onto the panel by pushing the handle outward.



Step #3

Make sure the arrow on the seamer points in the direction that you are seaming.

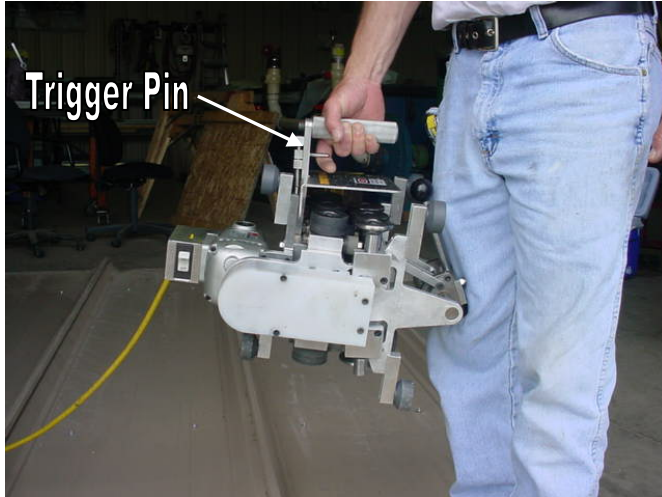


Step #4

Run seamer to the end of the panel.

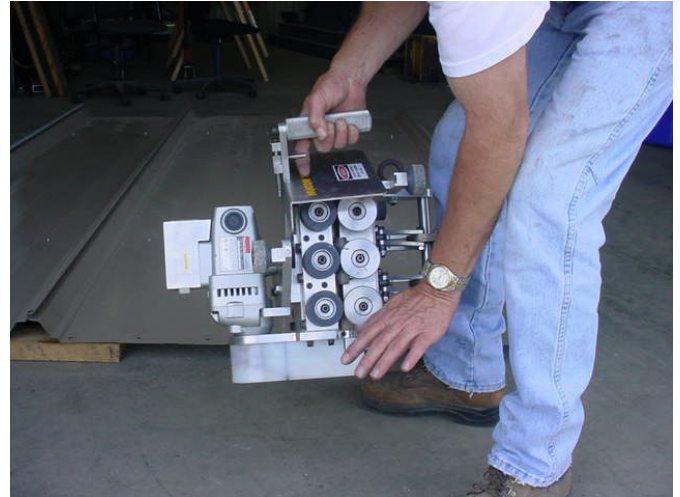
8.0 | MOTORIZED SEAMING MACHINE

8.4 | ROTATING THE BI-DIRECTIONAL SEAMER



Step #5

Next, un-lock the seamer from the panel seam. Pull up on the trigger pin next to the handle.



Step #6

Rotate the seamer 180°, allowing the trigger pin to latch.

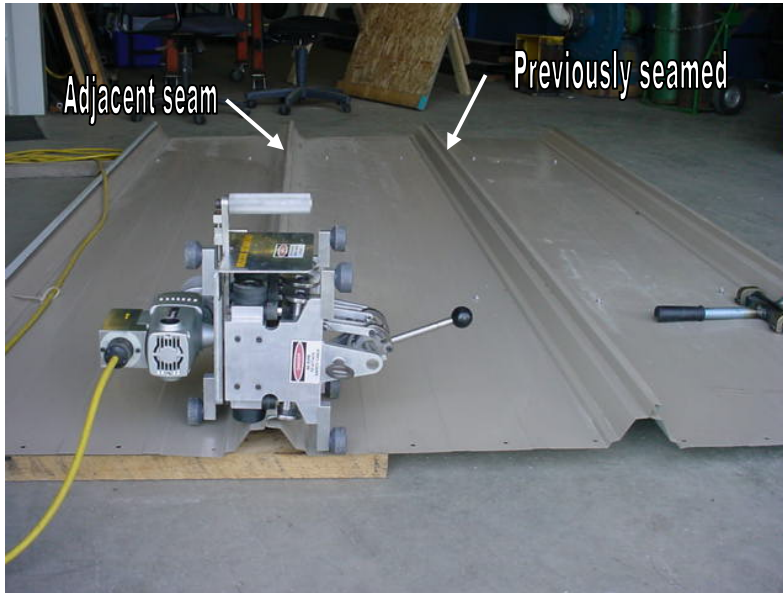


Step #7

The seamer fully rotated.

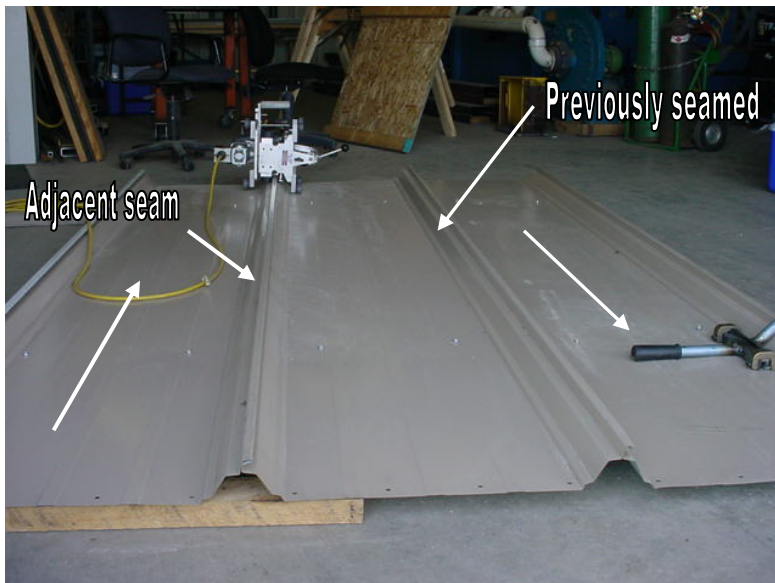
8.0 | **MOTORIZED SEAMING MACHINE**

8.5 | **MACHINE POSITION ON THE ROOF PANEL**



Step #8

Place rotated seamer on the adjacent seam. Lock onto manually seamed area of the panel.



Step #9

Seamer ran back to starting point on the adjacent seam. Repeat steps 1-9 along the panel run

8.0 **MOTORIZED SEAMING MACHINE****8.6** **RUNNING THE MACHINE**

Check that the machine's path is clear of power cords, tools, debris, etc.

Start the machine by turning on the machine's toggle switch.

When running the seamer, the operator should look ahead of the seamer for any damaged seams or un-seamed panels. If the operator sees damaged and/or un-seamed panels, then he/she should stop the machine and fix the problem area before continuing. **Failure** to repair such areas and then running the seamer over them could cause the seam to be **un-repairable**.

Watch the machine and the finished seam carefully for any indication of machine malfunction or faulty seaming.

CAUTION: The seaming machine must always be in the vertical position while seaming. **Do not allow the machine to tilt sideways when locking the machine onto the seam or while the machine is running.** On roofs with tall clips, walking or standing on the panel next to the machine can deflect the panel and cause the machine to tilt. **Do not walk or stand on the panel next to the machine while it is running.**

8.7 **UNLOCKING THE MACHINE**

After the machine is turned off and has fully stopped, release the locking handle to the open position. With the locking handle released, the machine can be lifted from the seam.

If the machine must be stopped and removed before completing the seam, use a felt marker to mark the position of the machine's front wheel on the panel. The machine can later be repositioned on the mark to complete the seaming.

8.8 **STOPPING THE MACHINE**

Stop the machine by turning off the machine's toggle switch.

Always allow sufficient space for the machine to coast after turning it off.

CAUTION: Stop the machine immediately, and investigate any indications of machine malfunction or faulty seaming. Do not run the machine into previously installed end dams or other obstructions. Do not run the machine over damaged seams or un-seamed panels.

8.9 **CHECKING THE FINISHED SEAM**

At the completion of each seam, check the full length of the seam for any false seaming or distortions. Refer to sections **9.2, 10.3, & 11.3** for details of correctly formed finished seams. **NOTE: Seaming options vary from project to project. Refer to the project erection drawings for specific seaming requirements for your project, then study the seaming details specific to your project as outlined in sections 9.2, 10.3, and/or 11.3.**

9.0 "NUCOR ROLL LOCK"™ SEAMING DETAILS

9 "NUCOR ROLL LOCK"™ SEAMING DETAILS

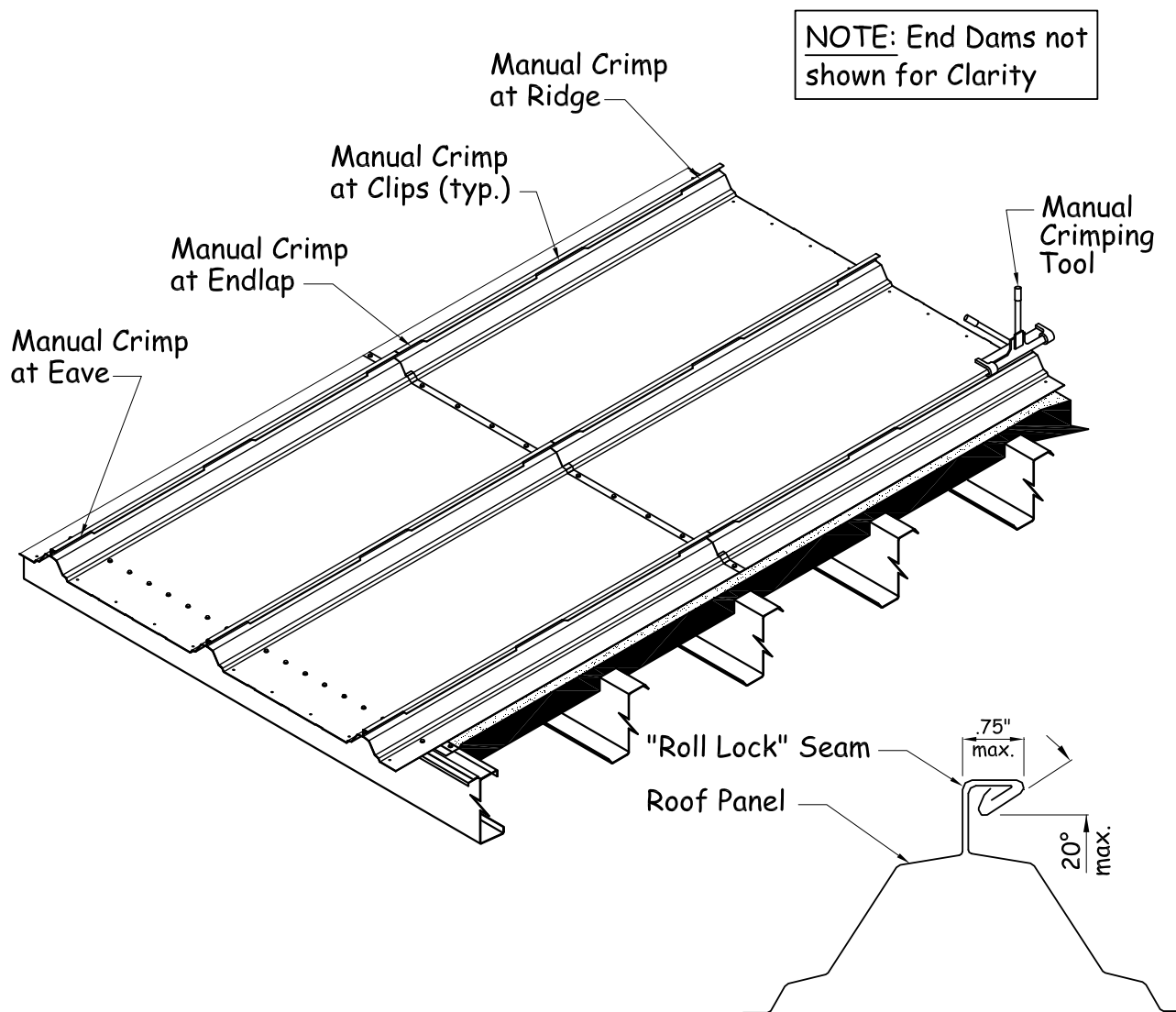
ridge ends of the panels, at the panel end laps, and at EACH clip.

9.1 MANUAL SEAMING

Along each roof panel seam, use the manual crimping tool to close the seam at the eave and

9.2 FINISHED SEAM DETAIL

Check that the finished seam is correctly formed as shown in the detail below.



10.0 “NUCOR VISE LOCK”™ SEAMING DETAILS

10 “NUCOR VISE LOCK”™ SEAMING DETAILS

10.1 MANUAL SEAMING

Prior to motor seaming, use the manual crimping tool to seam the roof panels at the starting end of the seam (eave or ridge end, depending on the seaming direction) and at the end laps.

10.2 MOTOR SEAMING

Seam the full length of each roof panel seam, using the Motorized Seaming Machine fitted with the “Nucor Vise Lock”™ forming rolls.

Set the seaming machine at the starting end of the seam, on the area previously seamed with the manual seaming tool.

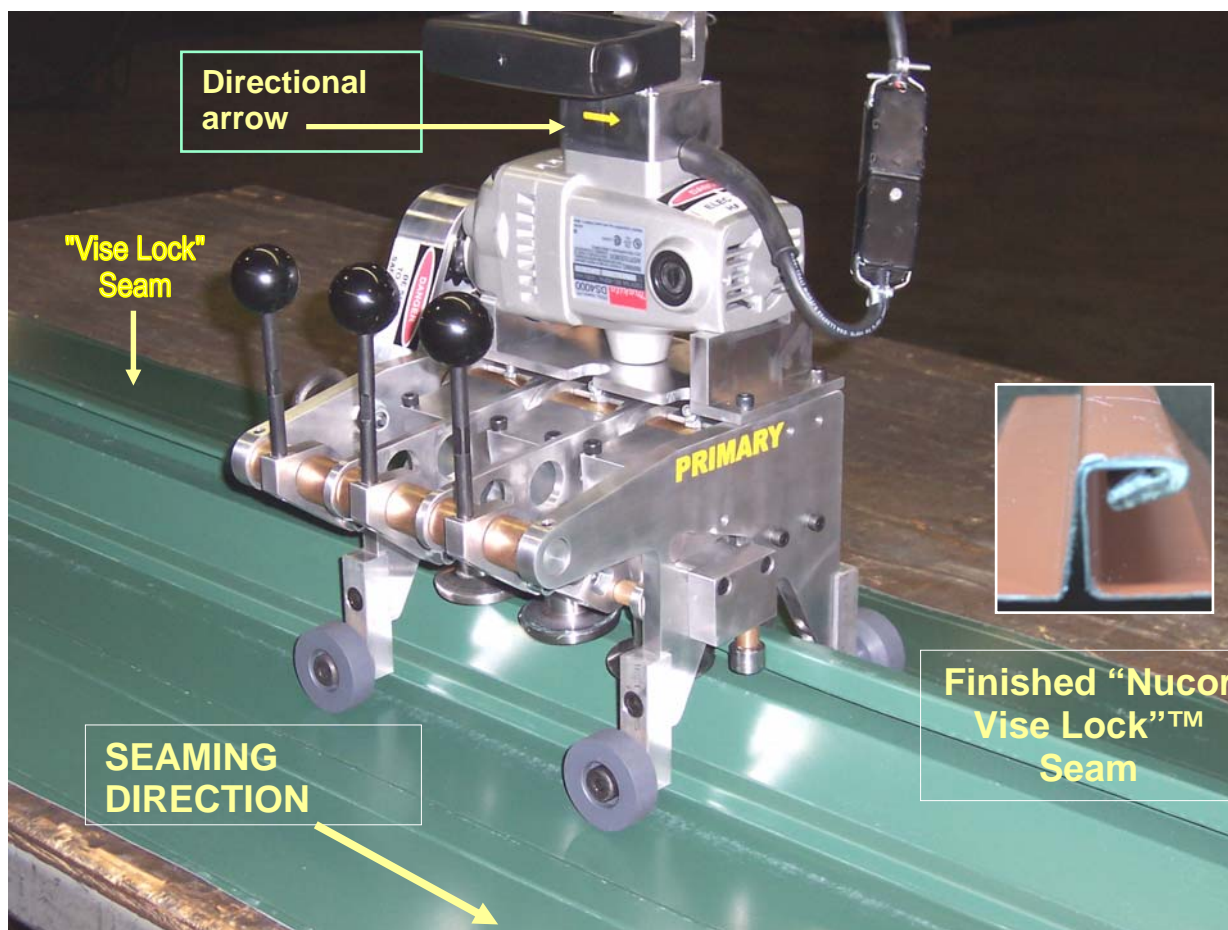
If the roof panels have end laps, **STOP the seaming machine just before running onto the end lap.** Remove the machine and restart it on the other side of the end lap, on the area previously seamed with the manual seaming tool. **NOTE: Failure to stop and restart the Motorized Seaming Machine at an end lap may cause damage to the roof panel.**

Run the seaming machine to the finished end of the roof panels.

At uncompleted seam areas, where the seaming machine had to be stopped prior to the end lap or ridge end dam, complete the seam with the manual seaming tool.

10.3 FINISHED SEAM DETAIL

Check that the finished seam is correctly formed as shown in the detail below.



11.0 “Nucor Vise Lock 360”™ SEAMING DETAILS

11 MANUAL CRIMPING TOOL OPERATION FOR “NUCOR VISE LOCK 360”™

11.1 TOOL ORIENTATION TO SEAM

Next is the process of manually crimping the panel rib into a 360° seam. Before you attempt the “Nucor Vise Lock 360”™ hand crimper: check and see if you have a good tight “Nucor Vise Lock”™ seam if not, then go over the area with the small “Nucor Vise Lock”™ hand crimper (H8100) and re-crimp. It is important to manually crimp the seam into a 360° seam prior to locking on and running the “Nucor Vise Lock 360”™ seamer. Start by placing the open 360°

crimper on top of the previously Vise Locked CFR panel rib and between a roof clip. Make sure that the flat side of the crimper is on the panel rib shoulder and the crimper hook is under the female lip. (See FIG 32A). Note the angle of the crimper. Next, apply outward and downward pressure to the handles to start folding down the top rib. Continue the outward and downward pressure until the panel rib is flat. (see FIG’s 33 & 32A).

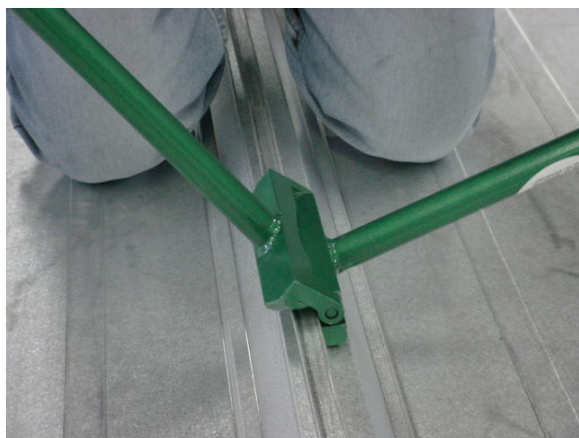


FIG 32

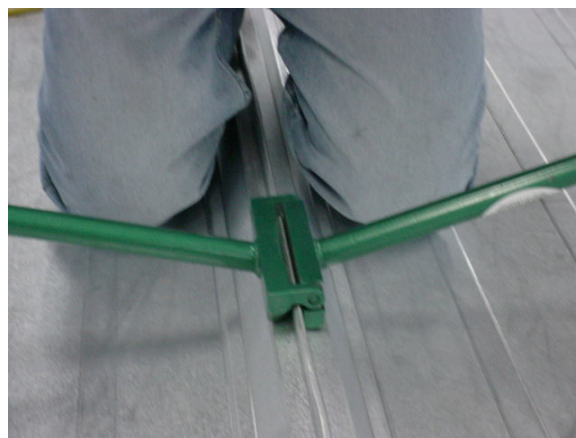


FIG 33

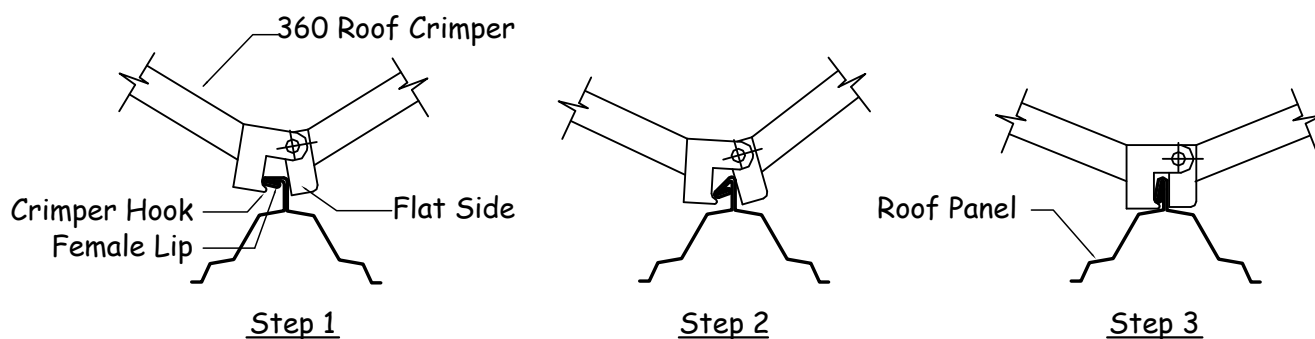


FIG32A

12.0 “Vise Lock 360”™ SEAMING DETAILS

12 “NUCOR VISE LOCK 360”™ SEAMING DETAILS

12.1 PRIOR SEAMING

Prior to “Nucor Vise Lock 360”™ seaming, the roof panels must have been fully “Nucor Vise Lock”™ seamed. This is accomplished with the Primary Motorized three or four Station Seaming Machine. In order to achieve a good “Nucor Vise Lock 360”™, you must first have a good “Nucor Vise Lock”™ Seam. Inspect all VL seams prior to running the VL360 seamer. Questionable VL seams should be re-crimped with the hand crimper or motorized seamed again with the “Primary Seamer”.

12.2 LOCKING SEAMER ON PANEL

Prior to running “Nucor Vise Lock 360”™ seamer, you must hand crimp a small area with “Nucor Vise Lock 360”™ hand crimper as described in **Section 11**. After the 360° hand crimping has been completed, place the “Nucor Vise Lock 360”™ seamer on the panel rib, aligning the number four station roll over the previously 360° hand-crimped area. (**Note:** Make sure the arrow on the seamer is pointing

in the direction you are seaming). Next lock down the first station handle, followed by the fourth station handle. Finish by locking down handles 2 & 3. Make sure that the number one station has engaged the panel as shown in Fig 34 below.

12.3 MOTOR SEAMING

Seam the full length of each roof panel seam, using the Motorized Seaming Machine that is labeled “Secondary”.

Start the machine at the starting end of the seam (eave or ridge end, depending on the seaming direction). Run the seaming machine to the finish end of the seams. The “Nucor Vise Lock 360”™ seaming machine can be run over the end laps.

12.4 FINISHED SEAM DETAIL

Check that the finished seam is correctly formed as shown in the detail below.



Fig 34



Finished “Nucor Vise Lock 360”™ Seam



Lock 360”™ Seamer

Four Station “Nucor Vise

13.0 Seamer Troubleshooting Guide**13 MOTORIZED SEAMING MACHINE MAINTENANCE****13.1 GENERAL**

The Motorized Seaming Machine is a precision fabricated, high performance, portable roll-forming machine. This relatively lightweight machine does the tough job of forming the extra strong “Nucor Vise Lock”™ and “Nucor Vise Lock 360”™ seams under often rugged field conditions.

Although designed for tough industrial use, the seaming machine requires proper maintenance to assure proper seaming and efficient, trouble-free operation.

CAUTION: Failure to properly maintain the seaming machine, as instructed below, can result in faulty or damaged seams and costly breakdown of the seaming machine.

13.2 SEAMING ROLLS

The seaming rolls require the following regular maintenance:

- a. Assure that the seaming machine’s rolls are clear of dirt, grease, sealant, and Galvalume/paint build-up etc. Rollers may be cleaned with mineral spirits. Please follow manufacturers instructions when using mineral spirits. Make sure rollers are clear of mastic and dry before seaming.
- b. Assure that the seaming machine’s rolls are tight on their shafts. Check and tighten the rolls’ retainer screws as necessary.

13.3 COOLING VENTS

To prevent motor overheating, the motor has vents and an internal fan to provide a cooling airflow over the internal motor ports.

The cooling vents are located at the front and rear of the motor. At the front of the motor, the vents are the slots between the motor housing and gear box. The rear vents are on the end of the motor housing. Check frequently to assure that these vents are kept clean and clear of debris and string sealant, etc.

While the machine is running, never cover the machine or place it in a position where the cooling airflow to the vents will be restricted.

13.0 Seamer Troubleshooting Guide

13.0 SEAMER TROUBLESHOOTING GUIDE

The chart below is a list of possible problems and solutions. *If you cannot resolve the problem with this chart, stop work immediately and contact Nucor Building Systems.*

Seaming Problem	Possible Cause	Look For	Recommended Fix
Seaming machine drag, stalling at clips, run intermittently, or won't run.	Extension cord too long and/or not heavy enough gauge.	7+amp at motor with no load (locking handle locked). 10+amp at motor during seaming (between clips).	Use a shorter and heavier gauge cord.
	Generator not supplying proper amps to seamer.	7+amp at motor with no load (locking handle locked). 10+amp at motor during seaming (between clips).	Use a larger generator.
	Faulty motor.	7+amp at motor with no load (locking handle locked). 10+amp at motor during seaming (between clips). Motor won't run.	Notify Nucor Building Systems for a replacement unit.
Seam hook not closed or improper nesting of male to female and/or clip.	Excess panel coverage width (typically 1/2" +).	Cladding or paint deposits on forming rolls.	Ensure correct coverage width at installation.
	Incorrect profile or damaged (deformed) clip or male/female panel leg.	Seam does not appear to be fully engaged.	Correct the profile of the male/female panel leg. If necessary, hand crimp the corrected area.
Creasing, scuffing, etched line along top of seam, and/or deformation of seam.	Cam roller does not turn freely.	Cam roller bearing frozen, or fouled by sealant.	Clean and lubricate or replace cam roller.
Cladding/paint pick-off.	Incorrect profile or damaged (deformed) clip or male/female panel leg.	Seam does not appear to be fully engaged.	Correct the profile of the clip or male/female panel leg. Hand crimp the corrected area.
	Excess panel coverage width (typically 1/2" +).	Cladding or paint deposits on forming rolls.	Ensure correct coverage width during installation.