

 **KWM**<sup>®</sup>  
Gutterman<sup>INC.</sup>

**OPERATING AND MAINTENANCE  
TROUBLE SHOOTING GUIDE**



**6"**

Manufactured by:  
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## 6" PANTHER GUTTER MACHINE SPECIFICATIONS

- POWER - 3/4HP., 110 V., SINGLE PHASE T.E.F.C. MOTOR, 13.6 AMP.
- DIMENSIONS - LENGTH - 122 1/2"  
- HEIGHT - 48"  
- WIDTH - 28"
- WEIGHT - APPROX. 1500 LBS.
- DRIVE - POWERED TOP AND BOTTOM DRIVE FORMING ROLLER VIA CHAIN AND SPROCKETS.
- SHEAR - FRONT PULL GUILLOTINE STYLE SHEAR.
- SPEED - APPROXIMATELY 35' PER MINUTE.
- CONTROLS - EMERGENCY STOP BUTTON ENTRANCE END. MAIN OPERATORS PANEL EXIT END CONSISTING FORWARD AND REVERSE DRUM SWITCH  
- EMERGENCY STOP AND JOG BUTTON ENTRY END. MAIN OPERATORS PANEL EXIT END CONSISTING OF START AND PUSH BUTTONS, JOG RUN
- MATERIALS FORMED - 15" IN WIDTH.
- |                 |                  |
|-----------------|------------------|
| - PAINTED STEEL | MAX 26 GA.       |
| - ALUMINUM      | MAX .032 THICK.  |
| - COPPER        | 16 OZ. 3/4 HARD. |

## **SECTION 2**

### **SAFETY AND GENERAL MAINTENANCE**

With the proper care and maintenance, owners can look forward to long and trustworthy service from your PANTHER GUTTER FORMING MACHINE.

1. Never transport your machine without material fed through all stations. The absence of material can allow the machine to vibrate out of adjustment and can cause the top and bottom roller to clatter together leading to damage. When possible unpainted materials should not be run through machine. In the event this happens, a thorough cleaning of the forming rollers will probably be needed before running painted material.
2. Be sure all safety covers are secure and in place, take note of all warning labels and read manual prior to operation of this machine.
3. Use proper wire gauge extension cord according to table on page 4.
4. Loose fitting clothing and/or jewelry can be dangerous while operating machine.
5. Be sure all operators of this machine are knowledgeable of all safety precautions and operating procedures.
6. Before cleaning or making any adjustments to machine. Stop machine and disconnect power supply.
7. Keeping the machine and its rollers clean is very important. Acetone and paint thinner have proven very effective in cleaning the forming rollers. These products clean rollers of dirt and other residues without leaving a film to pass on the gutter or collect more dirt.
8. A small amount of chain lube on chains once a month, helps keep them free moving.
9. If at all possible store machine indoors. If it must be kept outside cover it loosely to help prevent condensation. Keep all chains and shear lubricated.

**CAUTION: Never attempt cleaning with the machine running.**

## SECTION 3

### MOUNTING MACHINE

Mounting machine in truck and/or trailer.

1. When choosing a vehicle or trailer for your machine consider the gross machine weight including coil.
2. Check mounting surface for its integrity and make any repairs necessary prior to installation.
3. Bolt machine to the bed of the vehicle using 3/8" dia. bolts grade 5 four places. Do not draw machine down to an unflat surface, shim as needed to insure four place mounting.

## SECTION 4

### Electrical Nomenclature, Functions and Precautions

MAIN OPERATORS PANEL. (Right side exit end)

The main operators panel is located on the O.G. face side of the machine, at the exit end. The main operators panel consists of:

Selector switch #1.	(forward reverse)
Selector switch #2.	(jog-run)
Green push button.	(start actuator)
Red push button.	(stop actuator)

ENTRY OPERATORS PANEL. (Right side entry end)

The entry operators panel is located on the O.G. face side of the machine, at the entrance end. The entry operators panel consists of:

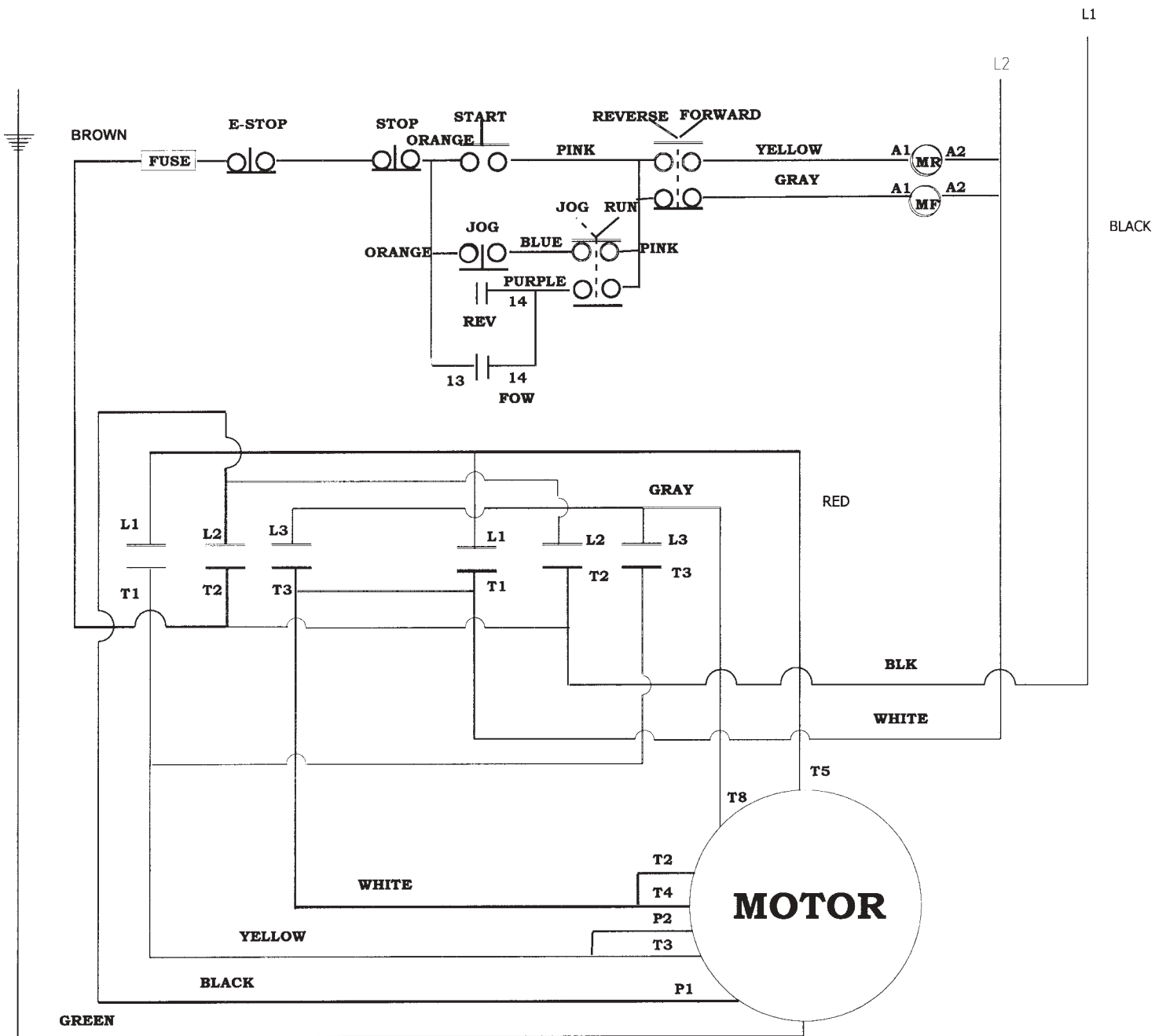
Green push button.	(start actuator jog only)
Emergency Stop.	(power shut off)

### EXTENSION CORD TABLE

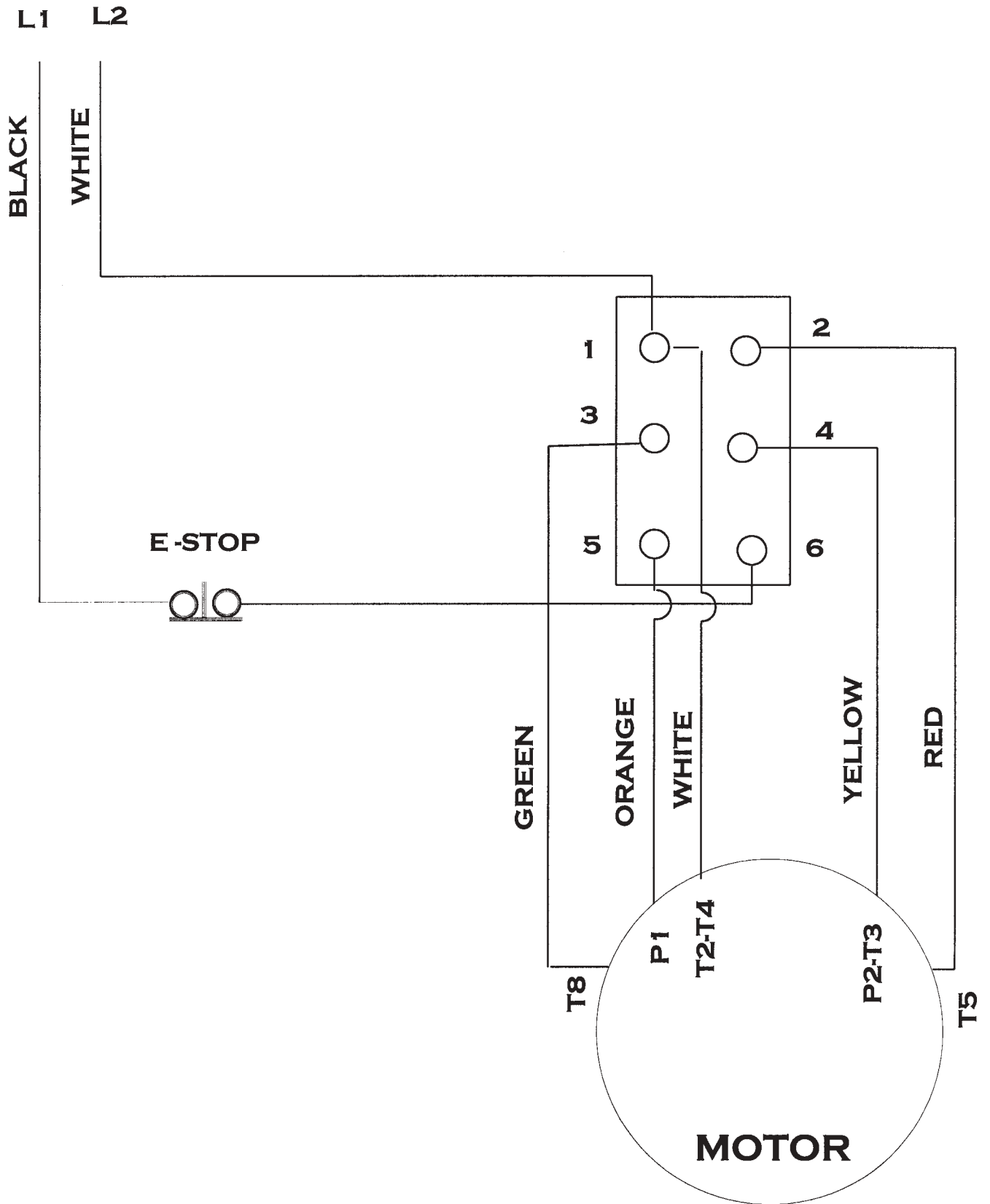
LENGTH OF CORD	WIRE GAUGE (COPPER WIRE)
UP TO 25'	12 GA.
25 TO 50'	10 GA.
50 TO 100'	7 GA.

(For wiring help see diagram on page 5.)

# PUSH BUTTON WIRING DIAGRAM



# DRUM SWITCH WIRING DIAGRAM





## SECTION 5

### MACHINE ORIENTATION

For communication purposes in the manual. Machine orientation is as follows.  
(see pg. 8)

#### A. ENTRANCE

The entrance is where the forming process begins, where the material is fed.

#### B. EXIT

The exit is where the forming process is complete and the finished gutter exits the machine.

#### C. RIGHT SIDE

The right side of the machine is determined when facing the entrance of the machine. The right side of the machine is the O. G. or face side.

Components on the right side:

- All electrical components.
- Right entrance guide shoe.
- Face guide bar.
- Lip forming box.
- #8 bell wheel.

#### D. LEFT SIDE

The left side of the machine is determined when facing the entrance of the machine. The left side of the machine is the back or dead roller side of the gutter.

Components on the left side:

- Left entrance guide shoe.
- Drive train (gears sprockets and chains)
- Back guide bar.
- Bead roller assembly.

## E. CENTER

The center of the machine forms the main portion of the gutter.

Components in the center of the machine.

Station #1 top and bottom.

Gear box motor assembly.

Station #2 top and bottom.

Station #3 top and bottom.

Station #5 top and bottom.

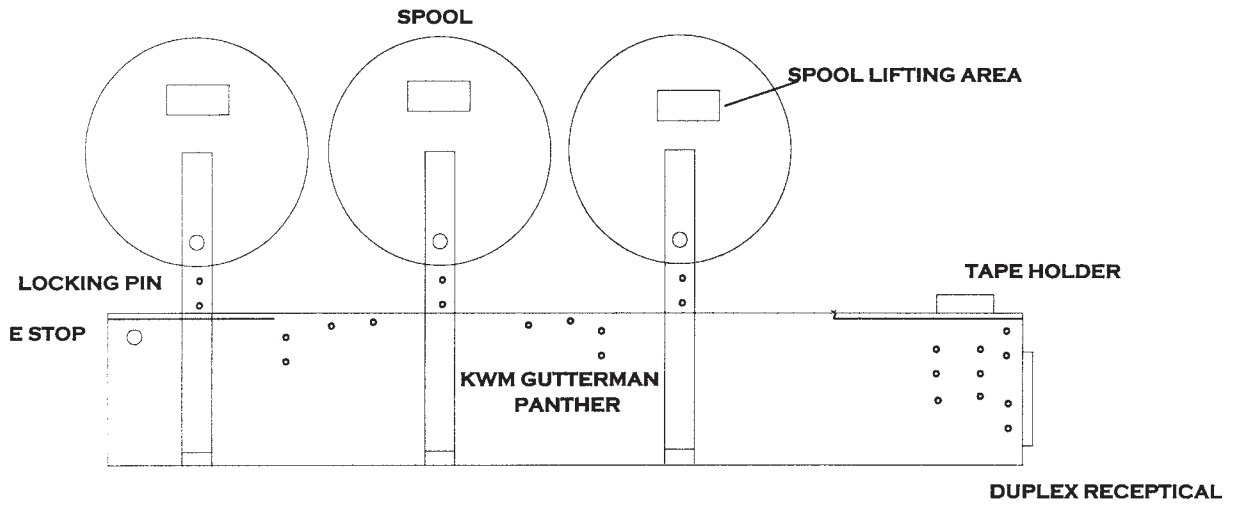
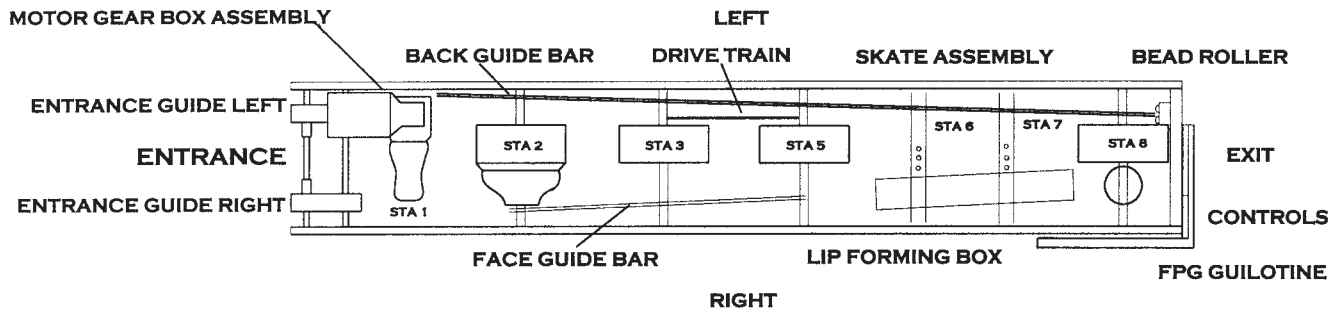
Skate assembly (stations #6 and #7).

Station # 8 top and bottom.

Front Pull Guillotine.

# MACHINE ORIENTATION

MATERIAL FLOW →



## **SECTION 6**

### **SPOOL UPRIGHT SUPPORTS**

The PANTHER upright system on your machine may consist of one two or three spool upright. The three spool upright system consists of: (SEE PG 11)

1. Left upright
2. Right upright (emergency stop side)
3. Motor cover cross bar
4. Flat lid cross bar 2 per three spool upright
5. Spool retaining pin
6. Hair pin cotter pin

## SECTION 7

### Spool assembly and loading coil.

Spool assembly consists of:  
(see pg. 11)

Fixed spool half.

Movable spool half.

1 5/16 spool bar.

5/16" Quick release pin (movable side)

5/16" Bolt (fixed side)

### Loading Coil

Remove spool from upright. With the spool on the ground or a flat surface remove 5/16" quick release pin from the movable spool half. Remove the spool half from the spool assembly. Insert the fixed spool half and the 1 5/16" spool bar thru the coil. Reinstall movable spool half. Install 5/16" quick release pin.

DO NOT move the fixed half of the spool assembly. This half remains fixed to insure alignment of the coil with the center line of the machine.

With the spool and coil assembled and ready for loading, attach an approved lifting device to lifting hole. Before loading coil make sure spool retaining pin is in the outward position and the fixed side of the spool is to the spool retaining pin side of the upright.

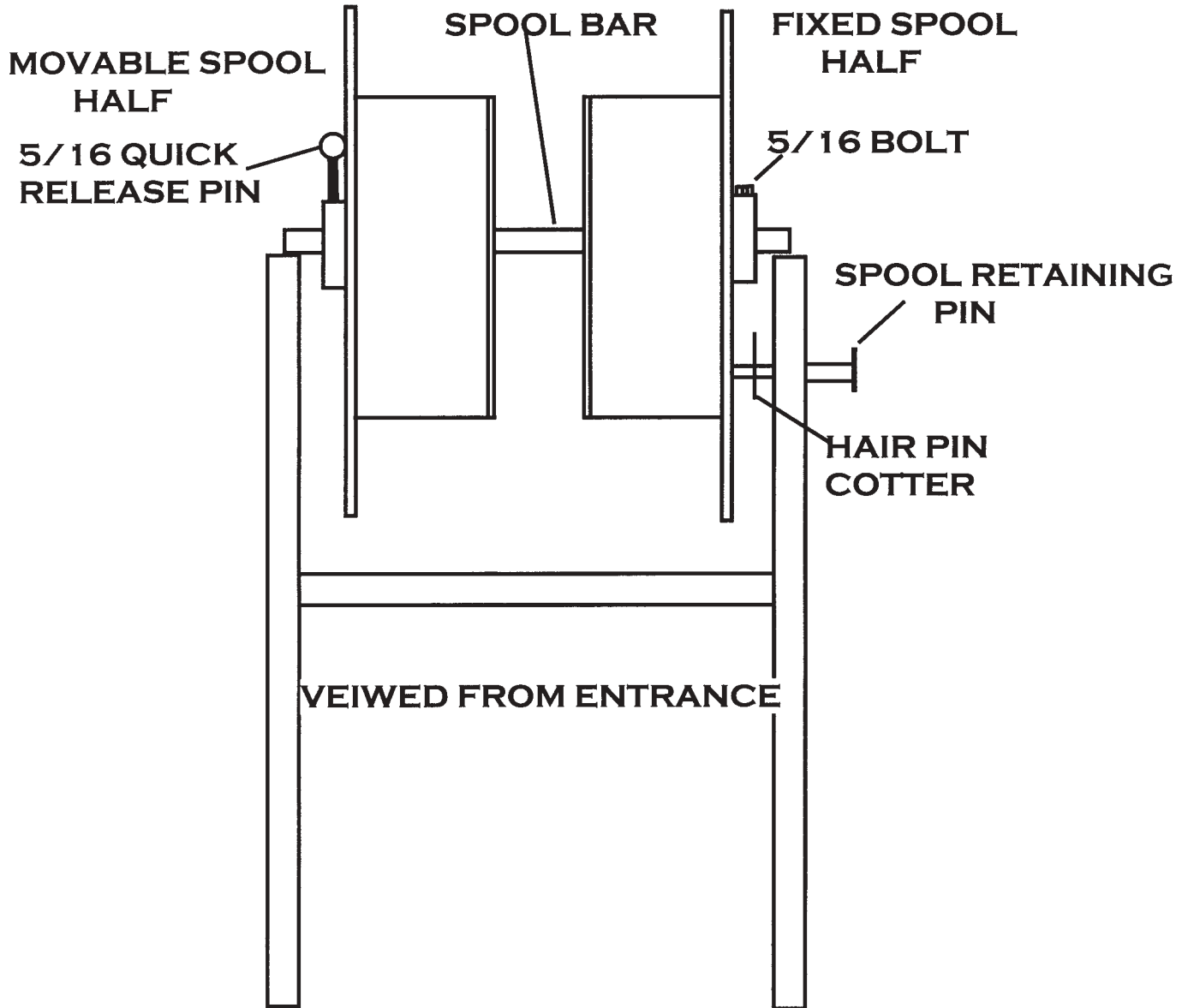
#### PRECAUTIONS:

- a. Never load coil with the spool retaining pin in the inward position.
- b. Make sure loading area is clean and clear of debris.
- c. Never operate machine without first checking spool retaining pins, pins must be in the outward position.
- D. Never transport machine without reinstalling spool retaining pins.

THESE PRECAUTIONS ARE FOR OPERATOR SAFETY AND TO PREVENT DAMAGE TO YOUR MACHINE.

# SPOOL AND UPRIGHT ASSEMBLY

## ALUMINUM



## SECTION 8

### ENTRANCE GUIDE SYSTEM

#### 1. Entrance guide system consists of:

- a: Right entrance guide shoe
- b: Left entrance guide shoe
- c: Right entrance guide locking bolts
- d: Left entrance guide locking bolts
- e: Entrance cross support bar
- f: Exit cross support bar

#### 2. Purpose and precautions of the entrance guide system.

The entrance guide system is a very important part of this machine. Not only is it used to position material being fed into the machine it controls the lateral relationship of the material to the forming roller.

The size of the hanger lip portion of the gutter is controlled by the right entrance shoe, the right entrance shoe controls the lateral position of the material in the machine. The factory setting for the right entrance shoe is 1 3/8" of metal being formed by the lip box.(see pg. 16)

#### 3. Adjusting left shoe for various coil widths. (see pg. 13)

##### Wider coil:

Loosen locking bolt D two places on the bottom of the left entrance shoe. Move left entrance shoe to the left. Insert material square to and up against right guide, move left guide to the right to desired width. The material must have free front to back movement with little to no side to side movement. Re-tighten locking bolt D two places.

##### Narrower coil:

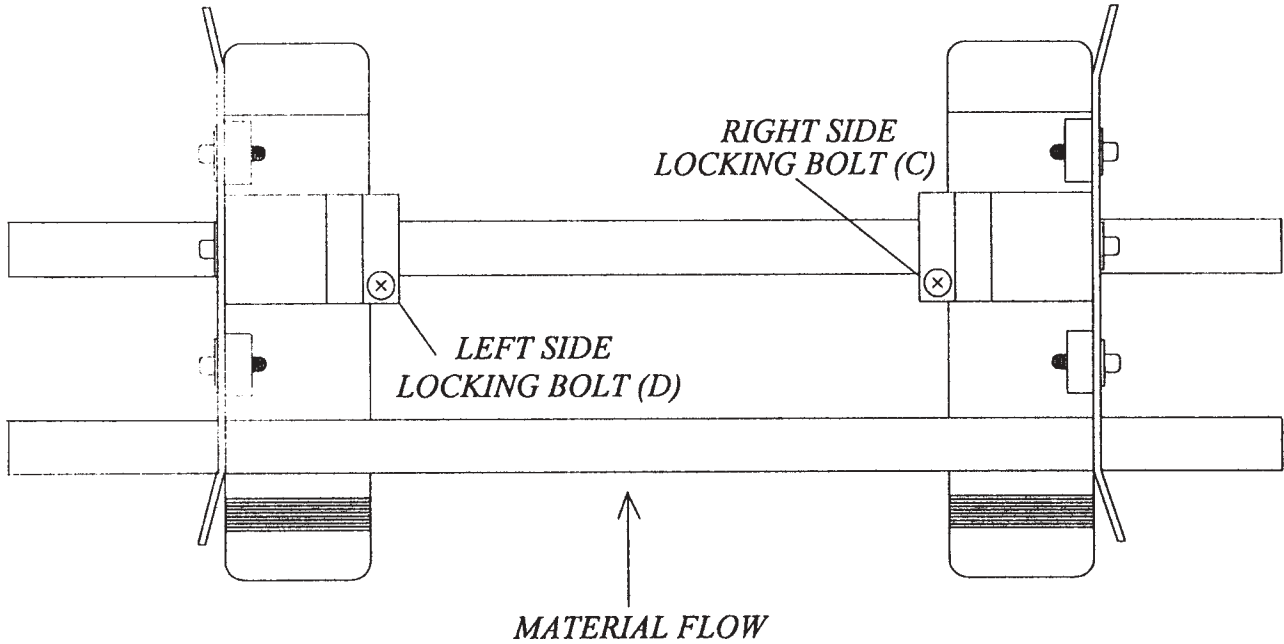
Loosen locking bolt D two places on the bottom of the left entrance shoe. Insert material square to and up against right guide, move the left guide to the right to desired width. The material must have free front to back movement with little to no side to side movement. Re-tighten locking bolts D.

**Caution make sure guide shoes are not restricting the forward and reverse movement of the material. Over tight or not square guide set up will cause unnecessary wear to the drive system and the entrance guide system, this will also cause the material to burr as it passes thru the guide system.**

# ENTRANCE GUIDE ASSEMBLY

(B)  
LEFT ENTRANCE  
GUIDE SHOE

(A)  
RIGHT ENTRANCE  
GUIDE SHOE



MANUAL13.CAD



## SECTION 9

### FORMING COMPONENTS (Guide bars)

#### GUIDE BAR COMPONENTS:

The guide bars in a fixed position relative to the forming rollers. The guide bars are not adjustable components.

The back guide bar supports the back portion of the material thru the complete forming process and bends the back bottom corner of the gutter. The back guide bar is in contact with the gutter at all times.

The face guide bar supports the face portion of the material guiding it into the lip forming box assembly.

#### MAINTENANCE:

Check guide bars for any marks, burrs, or build up that could cause a mark or a scratch on the gutter. Cleaning guide bars, lightly sand guide bar using a fine grit Emery cloth, then polish out any remaining marks using Scotch Brite.

## **SECTION 10**

### **STATIONS 1 THRU 7 FACTORY SETTINGS**

#### **STATION #1 (BULLET ROLLER)**

The bullet roller is factory set at .040 gap, in line with the bottom #1 and square over the bottom #1. For further assistance contact your servicing distributor.

#### **STATION #2 (TOP #2)**

The top #2 roller is factory set at .090 gap. The lateral setting is alignment over bottom #2 (see pg.8)

#### **STATION #3 , #4 AND #5**

Top drive rollers are factory set at .017 gap. The lateral setting is .900 from the inside of the back keel rail to outside of the top roller and square to center line of bottom #3 and #4. (see pg.8)

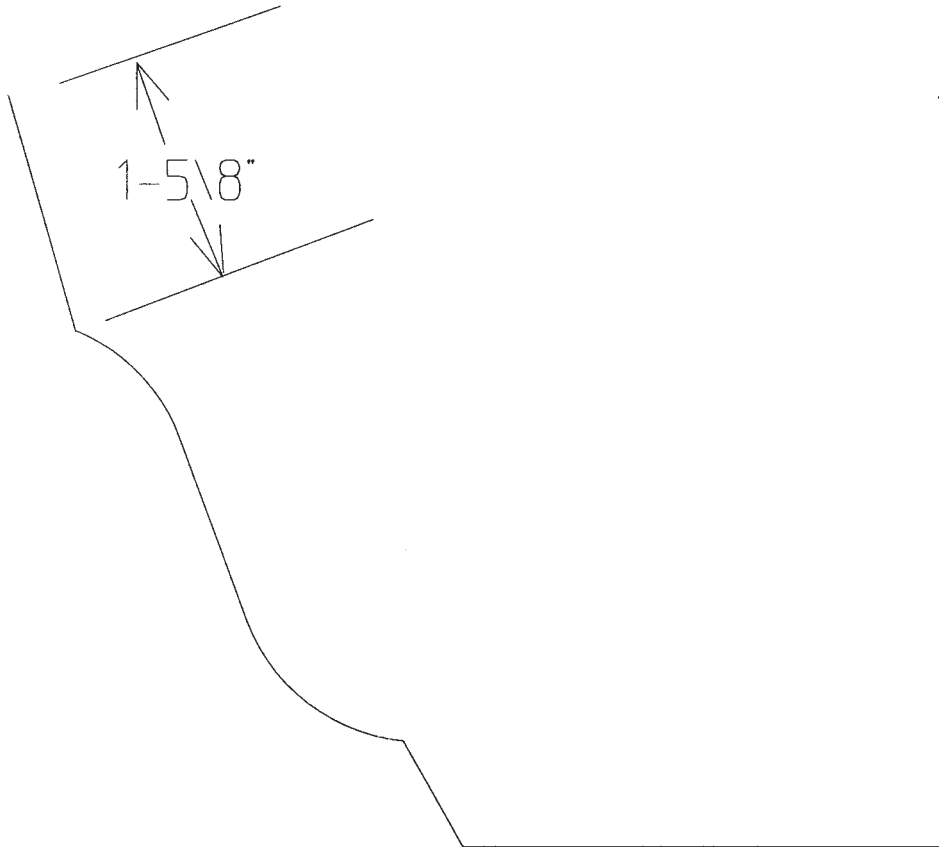
#### **STATION #6 AND #7 (SKATE ASSEMBLY)**

The skate assembly is factory set at .027 gap. The lateral position is .040 from radius of backside of the bottom #6 and #7 and square to center line of bottom rollers.

#### **PRECAUTIONS:**

**The above factory setting should not be altered. A factory square is required in order to square top rollers to bottom rollers.**

# GUTTER PROFILE AFTER #2 STATION



## **SECTION 11**

### **Lip forming box (Forms the top portion of the gutter)**

The forming box consists of seven stations #1 being the entrance #7 being the exit.

#### **Maintenance:**

Check rollers for marks, burrs or build up, if a roller becomes marked use fine grit emery cloth to remove the mark. Then polish out any remaining marks or scratches with Scotch Brite.

#### **COLOR CODED ADJUSTMENTS:**

Black: Entrance box mount  
Blue: Swing shaft  
Green: Exit box mount (see.19)

#### **FACTORY SETTINGS AND ADJUSTING ENTRANCE END OF LIP BOX:**

The entrance box mount vertical setting is the alignment of the 1 3/8" bend from the #2 station to the inside radius of the #1 outside box roller (no double track). The lateral setting is 2.500" from the inside wall of machine to the outside edge of the entrance of the forming box.

#### **Entrance box mount. (Black station) Vertical adjustment.**

To raise this station loosen locking bolt B, turn adjustment bolt C clockwise 1/4 turn two places, tighten locking bolt B.

To lower this station loosen locking bolt B, turn adjustment bolt C counter clockwise 1/4 turn two places, tighten locking bolt B.

#### **Lateral adjustment.**

To move black station in towards gutter or out away from gutter. Loosen locking bolt B 1/4 turn, loosen locking nut on lateral adjustment bolt D, turn adjustment bolt D clockwise for in and counter clockwise for away. Tighten locking bolt B.

### **Exit box mount. (Green station)**

The vertical adjustment of the exit box mount is used to control the up and down hill on the face side of the bottom.

The lateral adjustment is used to control the width across the opening of the gutter. To adjust the exit box mount up or down loosen locking bolt J 1/4 turn, Turn adjustment bolt H counter

clockwise 2 plcs to lower and clockwise to raise not more than 1/4 turn, tighten locking bolt J.

To adjust laterally. Loosen locking bolt J 1/4 turn, loosen locking nut on adjustment bolt I, Turn adjustment bolt I clockwise to move in and counter clockwise to move away from gutter.

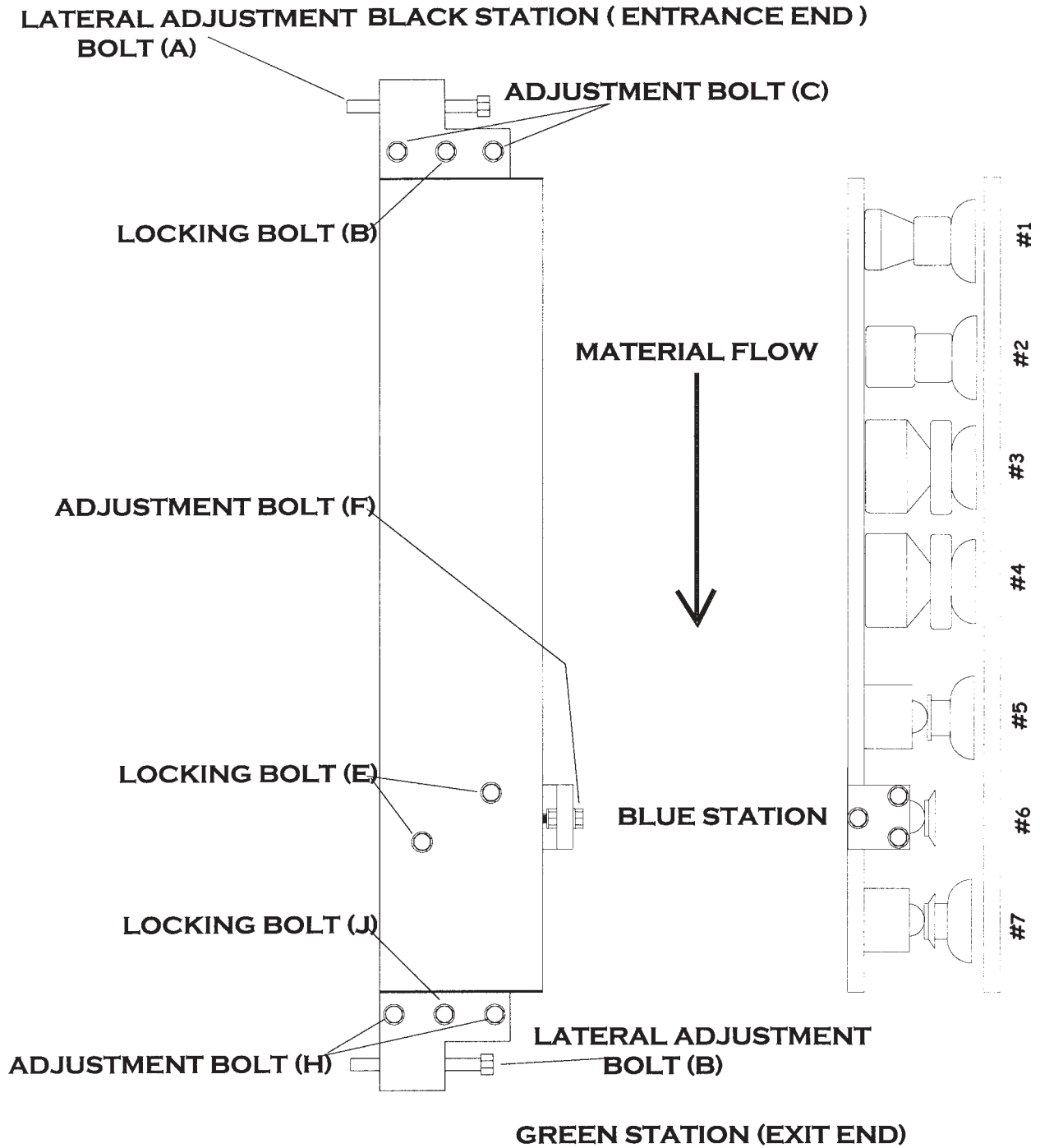
### **Swing shaft assembly. (Blue station)**

The # 6 station in the box is known as the swing shaft or the blue station. The primary use of this station is to control the top lip of the gutter. Adding pressure to this station will cause the top lip of the gutter to run into the facia and up hill on the face. Relieving pressure from this station will cause the top lip of the gutter to run away from the facia and down. Adding and or relieving pressure, loosen locking bolt E 2 places to allow the swing shaft assembly to slide, to add pressure turn adjustment bolt F clockwise to relieve pressure turn adjustment bolt F counter clockwise.

### **PRECAUTION:**

**THE FORMING BOX IS A CRITICAL PART OF THIS MACHINE WHEN ADJUSTING IN THIS AREA MOVE ADJUSTMENTS INCREMENTALY 1/8 OF A TURN AT A TIME. MOVING THIS ADJUSTMENT OUT OF ITS RANGE COULD CAUSE REVERSE AFFECT.**

# LIP FORMING BOX



## SECTION 12

### TOP # 8 DRIVE STATION AND BELL WHEEL ASSEMBLY

This is the last forming station in the machine. This station controls in and away from the facia and drives the metal out of the machine. To much pressure will cause a twist in the gutter not enough pressure will cause a ripple in the bottom of the gutter. The factory settings for this station are, .030 gap from shoulder of the bottom #8, .020 back side of the bottom and .007 to .015 on the front side of the bottom. The bell wheel gap is .030.

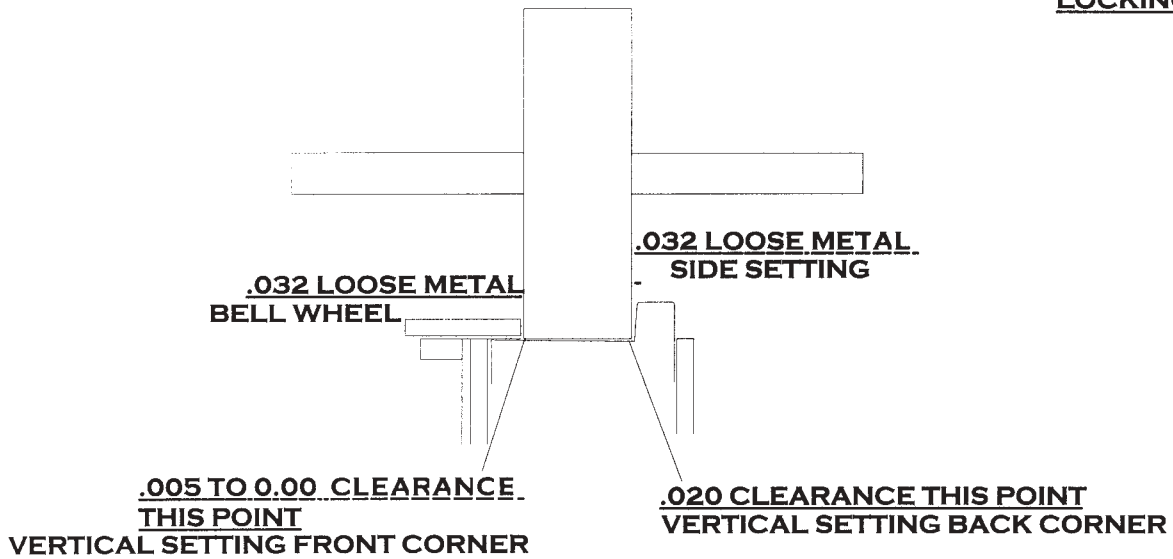
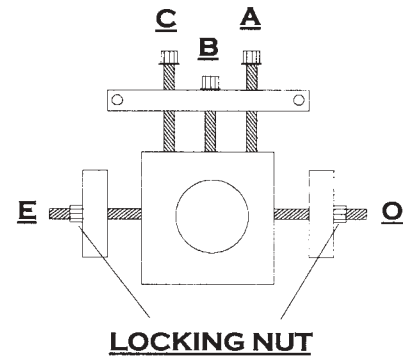
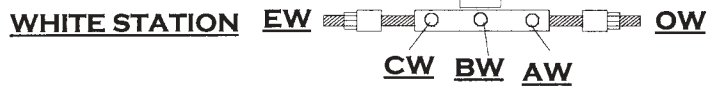
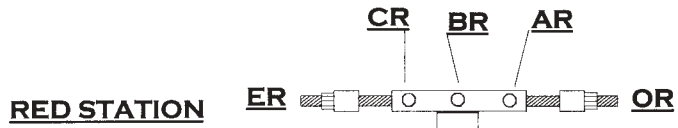
#### ADJUSTING TOP #8 STATION.

This station is color coded white on face side and red on back side. To vertically adjust this station, loosen locking bolt B two places, turn adjustment bolt A counter clockwise to lower and clockwise to raise. To adjust laterally loosen set screw C two places witch will allow roller to move laterally.(see pg. 21)

#### ADJUSTING BELL WHEEL.

To adjust bell wheel vertically loosen set screw D to allow movement of the roller. To adjust laterally loosen locking bolt D, turn adjustment screw E clockwise to move away and counter clockwise to move closer. The vertical setting is alignment of the top of the bell wheel with the 9/16 bend. (see pg. 21)

# #8 STATION DETAIL





## SECTION 13

### BEAD ROLLER ASSEMBLY AND STRAIGHT BLADE GUILLOTINE ASSEMBLY

The bead roller assembly is used to give the back of the gutter some rigidity and also allow control of the back bottom corner.

#### ADJUSTING THE BEAD ROLLER

Adding pressure to the bead roller will cause the back bottom corner of the gutter to run uphill. Relieving pressure from the bead roller will cause the back bottom corner of the gutter to run downhill.

To add pressure loosen locking nut on adjustment screw Z, turn adjustment screw Z clock wise 1/4 turn, counter clockwise to relieve pressure. (see pg. 23)

#### MAINTENANCE.

The guillotine consists of a front and back plate and spacers allowing clearance for the guillotine blade. The guillotine is the most abused part of the machine. To keep it in good working order lubricate all moving and pivoting parts weekly with a non-detergent 90 WT. oil and keep all nuts and bolt tight.

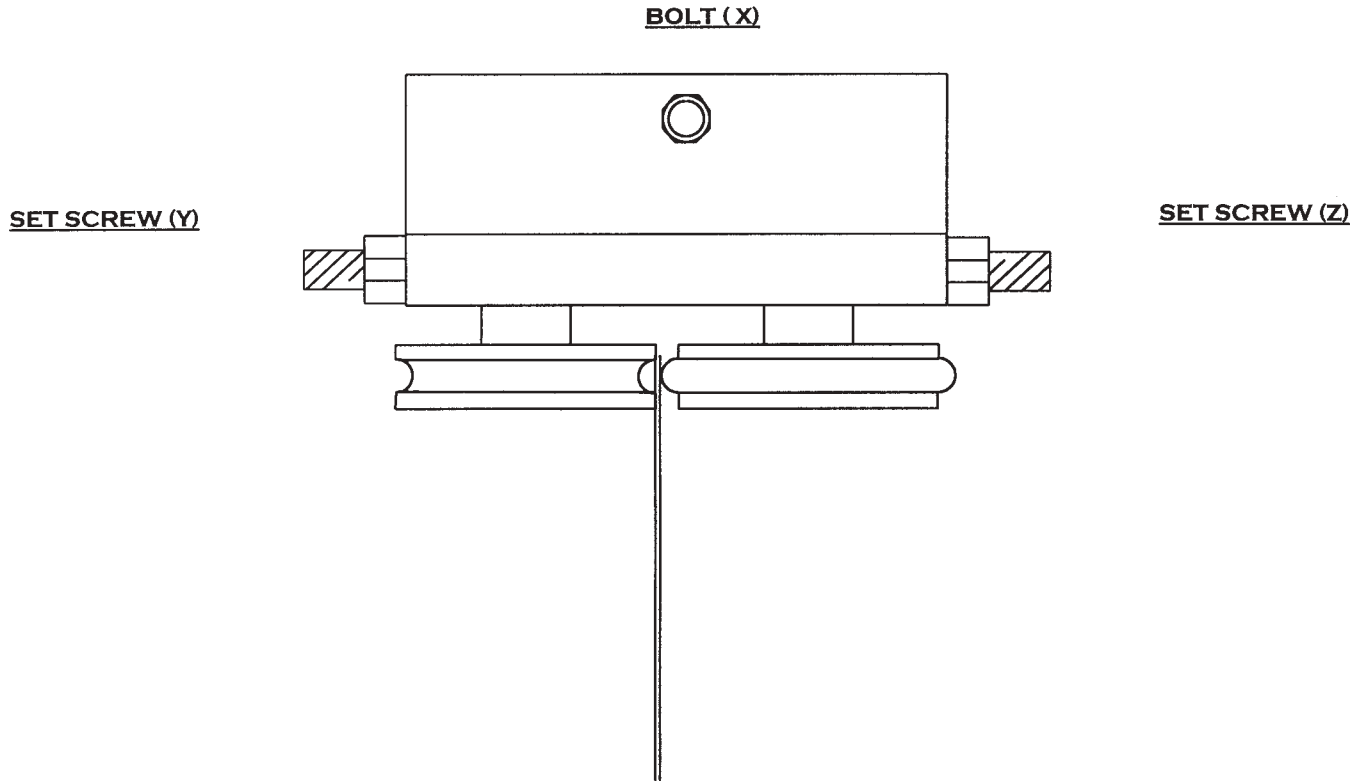
#### ADJUSTING GUILLOTINE POSITION

The guillotine is moveable in all directions. To move the guillotine up or down, loosen bolt A 4 places, loosen locking nut on adjustment bolt B 2 places. Turn adjustment B clockwise to raise and counter clockwise to lower. To move the guillotine side to side loosen bolt F as well as bolt A. The guillotine is now free to move in all directions. After the desired position is acquired, retighten A four places, locking nut on B 2 places, pull the guillotine to the down position and retighten F.

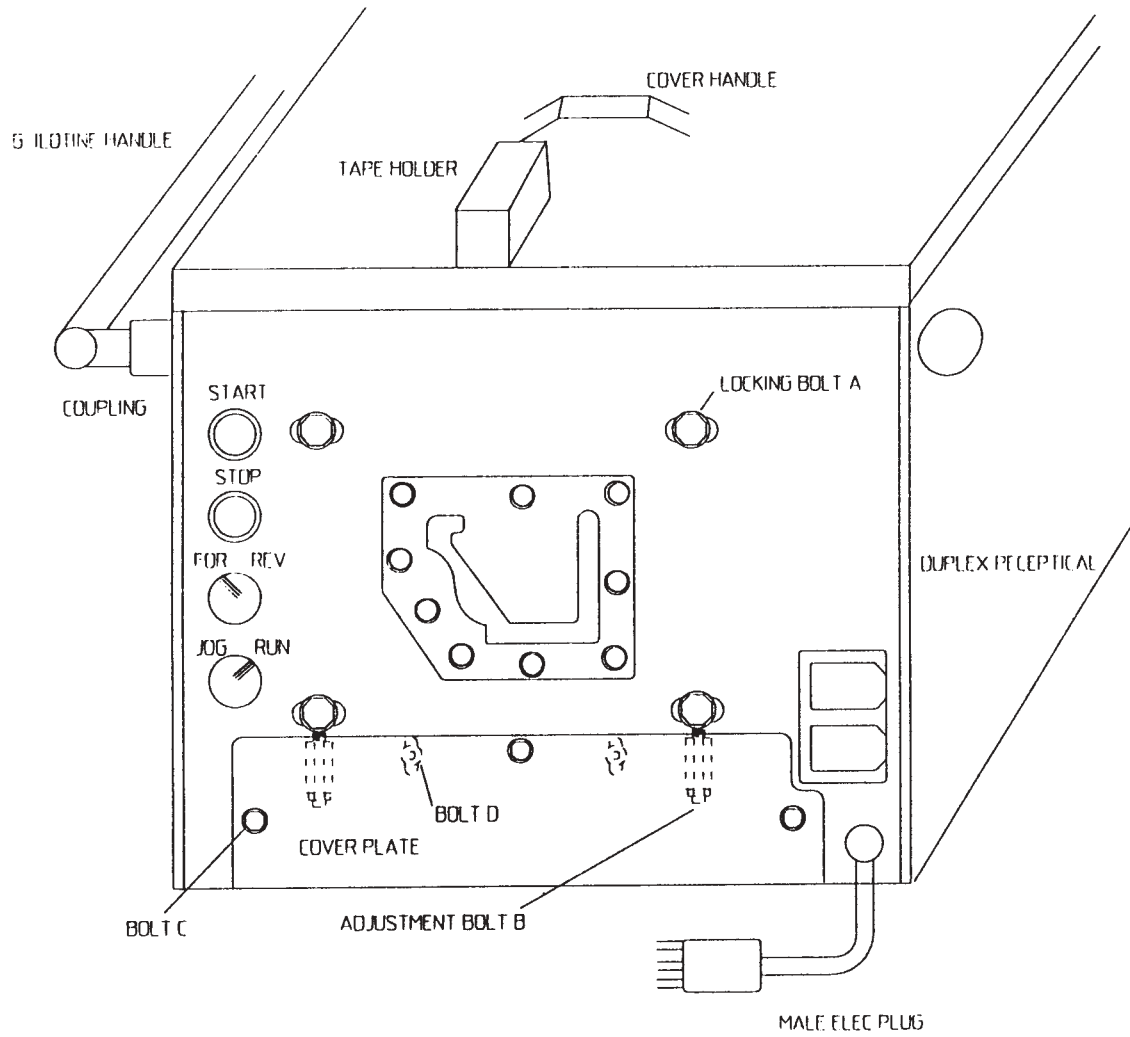
#### ADJUSTING THE DENT PLATE

The anti dent plate is factory set .030 gap below the gutter. To raise or lower loosen bolt C 2 places.

# BEAD ROLLER ASSEMBLY







## **SECTION 14**

### **GUTTER TALK**

Common terms describing the condition of the gutter. (See pg.26)

#### **INTO THE HOUSE**

This term describes a condition where the ends of the gutter are closer to the fascia board than the center. Looking from the machine the gutter has a lefthand curve. Visually you will be looking down lines 6 and 7.

#### **AWAY FROM THE HOUSE**

This term describes a condition where the center of the gutter is closer to the fascia board than the ends. Looking from the machine the gutter has a righthand curve. Visually you will be looking down lines 6 and 7.

#### **UP HILL**

This term describes a condition where the ends of the gutter are bowing up. Visually you will be looking down lines 6 and 7.

#### **DOWN HILL**

This term describes a condition where the ends of the gutter are bowing down. Visually you will be looking down lines 6 and 7.

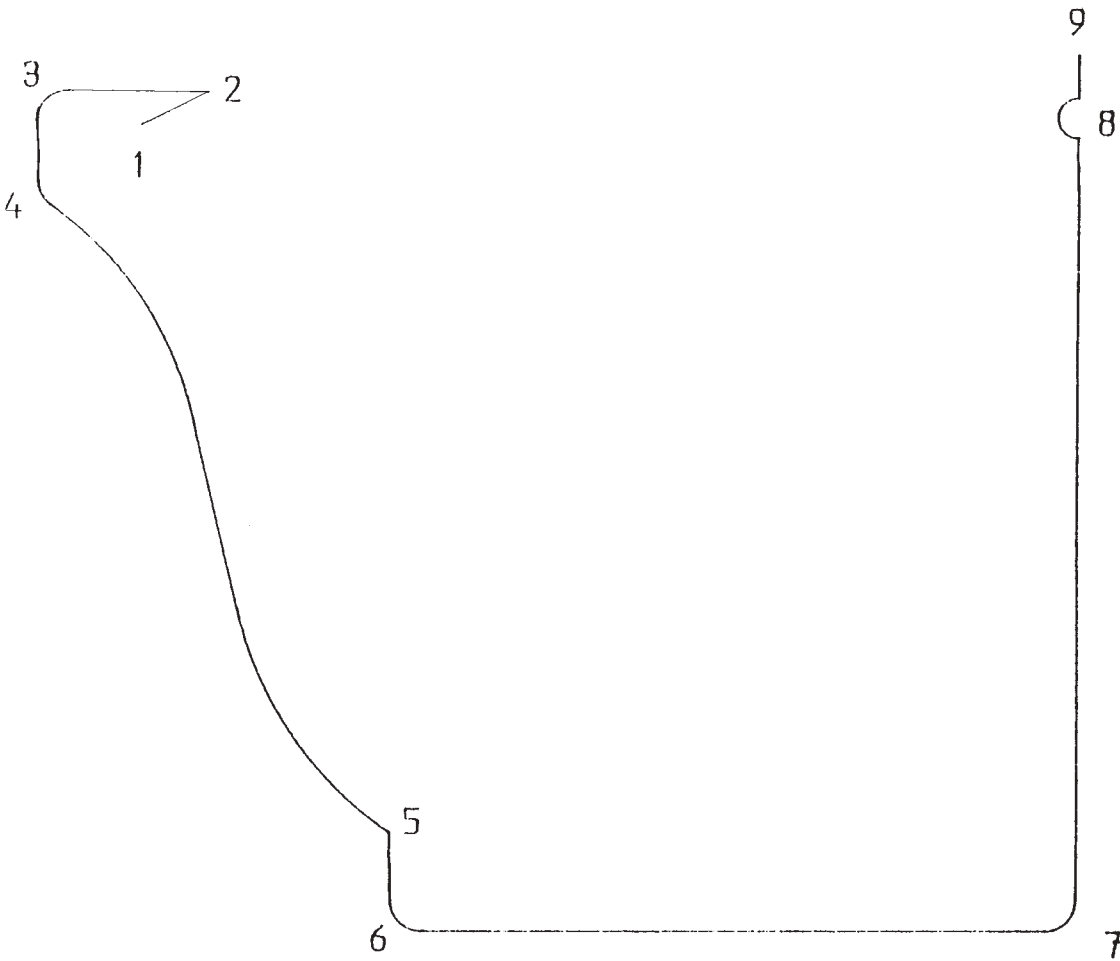
#### **TOP LIP INTO THE HOUSE**

This term describes a condition where the ends of the top lip are closer to the fascia board than the middle. Visually you will be looking down lines 3 and 4.

#### **TOP LIP AWAY FROM THE HOUSE**

This term describes a condition where the ends of the top lip are further away from the fascia than the middle. Visually you will be looking down lines 3 and 4.

# PROFILE OF GUTTER



## SECTION 15

### MACHINE OPERATION RECAP AND SUMMARY

This section is only a brief summary. Please read the entire manual prior to operating machine.

The order of operation.

1. Connect the machine to a 110v power source using the proper extension cord. (see pg. 4) Position drum switch to forward position.
2. Remove spool retaining pin from the spool you have elected to run.
3. Trim both corners of the coil at a 45 degree angle approximately 3" in from edges. Insert trimmed coil into the entrance guide system making sure coil is snug to both sides, with free front to back movement, push coil to the #1 drive station.
4. The drum switch can be used for forward and reverse operation of the machine once machine is fed. Run gutter to desired length and cut off using guillotine. Run-out support stands must be used to support gutter after 8'.
5. Prior to the completion of the last piece being produced, cut the coil stock before the entrance guides. Feed machine with the next job color prior to transportation of the machine. (NEVER TRANSPORT MACHINE WITHOUT COIL FED THROUGH ALL STATIONS.)

## SECTION 16

### TROUBLE SHOOTING GUIDE

First, correctly diagnose the problem. There are four places we read the gutter to see what is causing the problem.

The top lip, as far as straightness in and out to the fascia board is primarily controlled by the blue station, known as the swing shaft. (see pg.19)(see pg 26 areas 3 and 4 for profile)

The O.G. (Face Side) where it meets the bottom of the gutter is controlled by the Green station (see pg. 19) Exit end of the box for up and downhill of the front of the gutter. (pg.26 areas 5 and 6)

The White station (see pg.21) Face side of the #8 top roller, controls in and out from the fascia board.(pg.26 area 6 and 7)

The bead roller (see pg. 23)(crimper) controls up and downhill of the back of the gutter. (pg.26 area 7)

**\*NOTE: VISUALLY CHECK THE SHEAR TO MAKE SURE THERE IS NO INTERFERENCE FOR PASSAGE OF THE GUTTER THROUGH THE SHEAR (THE GUTTER WILL RUN AWAY FROM ANY INTERFERENCE CAUSED BY THE SHEAR)**

**\*NOTE: MACHINE WILL NOT PERFORM PROPERLY IF THERE IS INSUFFICIENT METAL IN THE FORMING BOX ( NOT ENOUGH LIP).**

The most common problem with a ROLLFORMER is improper alignment of the metal in the machine. This will cause several different problems with the finished product. Make sure to keep entrance guides tight and in good working order. If a problem with the lip occurs remove front and center cover and make sure you have 1 5/8 " of metal entering the forming box. This measurement is from the very top of the face side of the gutter down to the first bend, before it enters the forming box.(see pg. 16)

If measurement is not exactly 1 3/8", loosen bolts C 2 plcs, move right guide to the right for more metal or to the left for less metal. (see pg.13) Make sure right guide is square to right side of machine using a tape measure, measure from the inside of the right wall of the machine to the outside of the right entrance guide keeping the guide shoe parallel to the side of the machine.



## TROUBLE SHOOTING (CONT.)

Moving the guides to acquire 1 5/8" of metal as illustrated on pg.13 (EXAMPLE PROBLEM TO MUCH LIP. (1) REMOVE CENTER COVER AND FRONT LID. (2) WITH GUTTER RUN THROUGH GUILLOTINE 12" BACK GUTTER UP 6" CHECK FOR DOUBLE TRACK AT ENTRANCE OF BOX WHERE 1 5/8" BENT MEETS WITH BOTTOM OF INSIDE BOX ROLLERS. (3) MEASURE AMOUNT OF COIL IN BOX 1 3/4" INCORRECT AMOUNT OF METAL. (4) MEASURE RIGHT GUIDE SHOE NOTE MEASUREMENT, MOVE RIGHT GUIDE SHOE FROM WALL TO THE LEFT 1/8" KEEP GUIDE PARALLEL TO WALL. (5) MOVE LEFT GUIDE TO THE LEFT ALLOWING ENOUGH ROOM FOR COIL. (6) INSERT A 2' LONG PIECE OF COIL STOCK INTO THE GUIDE SYSTEM UP TO THE RIGHT GUIDE. (7) MOVE THE LEFT GUIDE TO RIGHT UNTIL IT LIGHTLY TOUCHES THE LEFT EDGE OF THE COIL. (8) TIGHTEN ALL BOLTS. (9) FEED THE MACHINE AND CHECK FOR 1 5/8" OF METAL.

## **TROUBLE SHOOTING (CONT.)**

**After any adjustments, run gutter past adjustment area, cut that section off. Then run a 10 foot section of gutter for inspection. Visually check gutter if needed, repeat adjustment to completely correct problem.**

### **Top lip curves in and bottom curves uphill.**

Relieve pressure from the blue station. This is achieved by loosening bolt E 2 plcs, Turn bolt F counter clockwise 1/2 turn. Jog gutter foreword 6", (YOU WILL SEE COMPLETE ASSEMBLY MOVE AWAY FROM GUTTER) tighten bolt E 2 plcs. (see pg.19)

### **Top lip curves away and bottom curves downhill.**

Add pressure to the blue station. This is achieved by loosening bolt E 2 plcs. Turn bolt F clockwise 1/2 turn. Jog the gutter foreword 6", tighten bolt E 2 plcs. (see pg.19)

### **Face of gutter where it meets bottom is running uphill, but the top lip is straight.**

Raise the exit end of the forming box, GREEN station. This is achieved by turning bolt J counter clockwise 1/2 turn. Turn bolt H clockwise 1/2 turn or until tight 2 plcs. (see pg.19)

### **Face of gutter where it meets bottom is running downhill, but the top lip is straight.**

Lower exit end of forming box, GREEN station. This is achieved by turning bolt H counter clockwise 1/2 turn 2 plcs. Turn bolt J clockwise 1/2 turn or until tight. (see pg. 19)

## TROUBLE SHOOTING (CONT.)

### **Back of gutter is running uphill.**

Relieve pressure from bead/crimper assembly. This is achieved by loosening lock nut on set screw Y. Turn set screw Y counter clockwise 1 full turn, tighten locking nut on set screw Y. (see pg. 23)

### **Back of gutter is running downhill.**

Add pressure to the bead/crimper assembly. This is achieved by loosening lock nut on set screw Y. Turn set screw Y clockwise 1 full turn, tighten locking nut on set screw Y. (see pg. 23)

### **Bottom of gutter is curving left (into the fascia).**

### **Bottom of gutter is curving right (away from the fascia).**

### **Back of gutter is not square-gutter is wide.**

Prior to making any of these adjustments, we need to check the position of the #8 top roller. Cut the coil stock and clear the machine. Visually check the gap between the bottom #8 and the top #8 rollers. The front side gap is 1/2 metal clearance and the back side is metal clearance. These are the height settings or vertical gaps. With the metal out of the machine, make sure the gap between the flange of the bottom #8 and the back edge of the top #8 is loose metal clearance (.032)(see pg.21) If the top #8 visually appears correct according to specifications above.

The only adjustment needed may be adding pressure to anti dent plate roller, for away from the fascia relieving pressure for into the fascia. The anti dent plate roller is located exit end just before shear.

To correct left curvature, we must relieve pressure from the WHITE station. Turn socket cap screws AW and CW counter clockwise 1/4 turn. Turn socket cap screw BW clockwise 1/4 turn or until tight.

## TROUBLE SHOOTING (CONT.)

To correct right curvature, we must add pressure to the WHITE station. Turn socket cap screw BW counter clockwise 1/4 turn. Turn socket cap screws AW and CW 1/4 turn clockwise or until tight.

**NOTE: IF THE TOP #8 IS TOO CLOSE TO THE FLANGE OF THE BOTTOM #8, THIS PROBLEM WILL ALSO OCCUR. MAKE SURE THE GAP BETWEEN THE BACK FLANGE AND TOP #8 IS MIN. (.032) LOOSE METAL CLEARANCE.**

To move the top roller, loosen set screws, on hub of roller tap into place using rubber mallet. To correct wide gutter back not square, move #8 top roller away from bottom flange, loosen set screws on hub move #8 back to loose metal clearance between back edge and flange of bottom #8. (see pg. 21)

