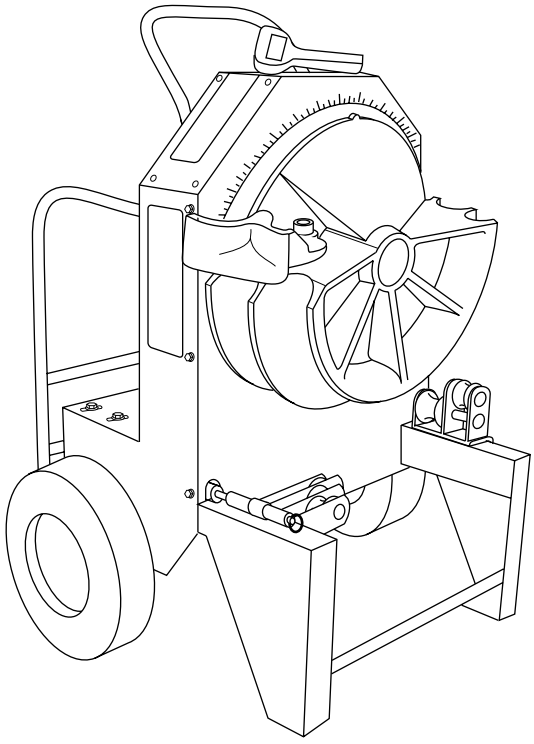
# INSTRUCTION MANUAL

GREENLEE®



# 555®
# ELECTRIC BENDER

**Read** and **understand** all of the instructions and safety information in this manual before operating or servicing this tool.


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## Description

The Greenlee 555® Electric Bender is intended to bend 1/2" to 2" conduit and pipe.

Bending shoe groups are available to accommodate the following types: Electrical Metallic Tubing, Intermediate Metallic Conduit, Rigid Conduit, PVC-Coated Rigid Conduit, and Schedule 40 Pipe. The shoe groups are shown in the Bending Attachment Groups section of this manual.

In addition to the 555, this manual also applies to the following models:

- 555E (includes accessories for bending Electrical Metallic Tubing)
- 555I (includes accessories for bending Intermediate Metallic Conduit)
- 555R (includes accessories for bending Rigid Conduit and Schedule 40 Pipe)

## Safety

Safety is essential in the use and maintenance of Greenlee tools and equipment. This instruction manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all of the safety information provided.

## Purpose

This manual is intended to familiarize personnel with the safe operation and maintenance procedures for the Greenlee 555® Electric Bender, with Serial Code AAJ.

Keep this manual available to all personnel.

Replacement manuals are available upon request at no charge.

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***KEEP THIS MANUAL***

# *IMPORTANT SAFETY INFORMATION*

## SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

**⚠DANGER**

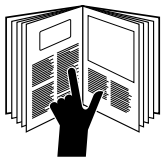
Immediate hazards which, if not avoided, WILL result in severe injury or death.

**⚠WARNING**

Hazards which, if not avoided, COULD result in severe injury or death.

**⚠CAUTION**

Hazards or unsafe practices which, if not avoided, MAY result in injury or property damage.



**⚠DANGER**

**Read** and **understand** all of the instructions and safety information in this manual before operating or servicing this tool.

Failure to observe this warning can result in severe injury or death.



**⚠DANGER**

Do not use this tool in a hazardous environment. Hazards include flammable liquids, gases, or other materials. Using this tool in a hazardous environment can result in a fire or explosion.

Failure to observe this warning will result in severe injury or death.



**⚠WARNING**

Electric shock hazard:

- Connect the power cord to a 120 volt, 20 amp receptacle on a ground fault protected circuit only. See Grounding Instructions.
- Do not modify the power cord or plug.
- Inspect the power cord before use. Repair or replace the cord if damaged.
- Disconnect from power before servicing.

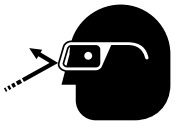
Failure to observe this warning can result in severe injury or death.



**⚠WARNING**

- Do not expose to rain.
- Do not use in wet or damp locations.

Failure to observe these warnings can result in severe injury or death.



**⚠WARNING**

Wear eye protection when operating or servicing this tool.

Failure to wear eye protection can result in serious eye injury from flying debris.



**⚠WARNING**

Do not remove guards.

Failure to observe this warning can result in severe injury or death.

# *IMPORTANT SAFETY INFORMATION*



## ⚠WARNING

Extension cords:

- Use only three-wire, 12-gauge extension cords that have three-prong grounding-type plugs and three-hole receptacles that accept the tool's plug.
- Do not use extension cords that are longer than 30 m (100').
- Repair or replace damaged extension cords.

Failure to observe these warnings can result in severe injury or death.

## ⚠WARNING

Make sure that the handle is properly installed and secured with the safety spring clips and snap pins before lifting or moving the bender. An improperly installed handle could allow the bender to fall, injuring nearby personnel.

Failure to observe this warning can result in severe injury or death.



## ⚠WARNING

Pinch points:

Keep hands away from bending shoe, rollers and conduit when bender is in use.

Failure to observe this warning can result in severe injury or death.

## ⚠WARNING

Unplug the bender before changing accessories. Accidental start-up can result in serious injury.

## ⚠CAUTION

- Conduit moves rapidly as it is bent. The path of the conduit must be clear of obstructions. Be sure clearance is adequate before starting the bend.
- Do not operate the bender while wearing loose clothing. Loose clothing can get caught in moving parts.
- Inspect the bender before use. Replace worn, damaged or missing parts with Greenlee replacement parts. A damaged or improperly assembled component could break and strike nearby personnel.
- Some bender parts and accessories are heavy and may require more than one person to lift and assemble.
- Use this tool for the manufacturer's intended purpose only. Use other than that which is instructed in this manual can result in injury or property damage.

Failure to observe these precautions can result in injury or property damage.

## Grounding Instructions



**⚠WARNING**

Electric shock hazard:

- Do not modify the plug provided with the tool.
- Connect this tool to a grounded receptacle on a 20 amp ground fault protected circuit.

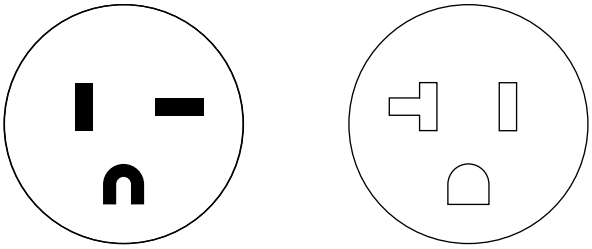
Failure to observe these warning can result in severe injury or death.

This tool must be grounded. In the event of a malfunction or breakdown, an electrical ground provides a path of least resistance for the electric current. This path of least resistance is intended to reduce the risk of electric shock.

This tool's electric cord has a grounding conductor and a grounding plug as shown. Do not modify the plug. Connect the plug to a corresponding GFCI-protected receptacle that is properly installed and grounded in accordance with all national and local codes and ordinances.

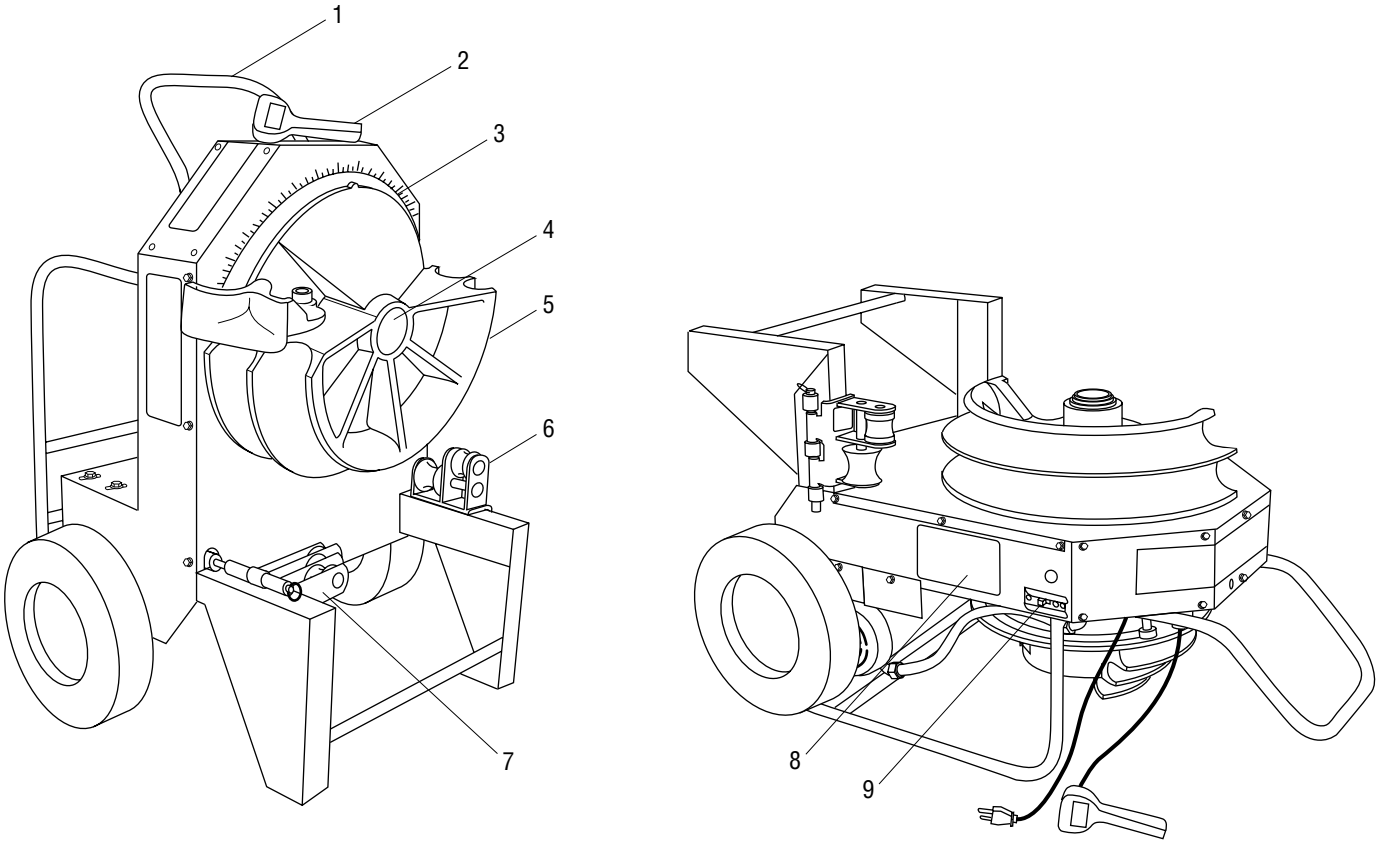
Do not use an adapter.

**NEMA 5-20**



Plug Receptacle

## Identification




**555R Electric Bender (shown)**

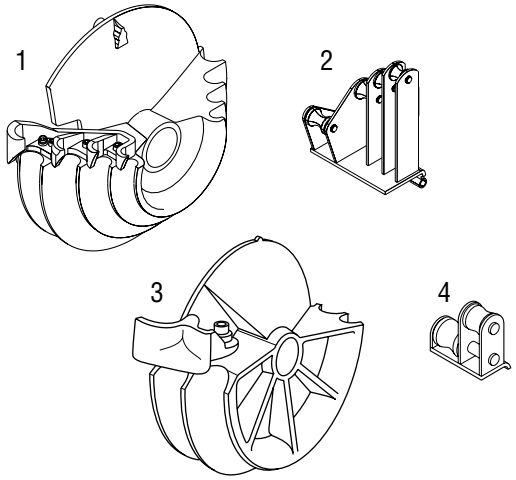
1. Handle
2. Pendant
3. Protractor
4. Main Shaft
5. Bending Shoe
6. 1-1/2" to 2" Roller Support
7. 1/2" to 1-1/4" Roller Support (in storage position)
8. Bending Instructions Decal
9. Circuit Breaker (ON/OFF switch)

## Specifications

| | |
|---|---|
| Height | 1118 mm (44") |
| Width | 724 mm (28.5") |
| Depth | 521 mm (20.5") |
| Mass/Weight (bender without shoes or roller supports) | 126 kg (278 lb) |
| Power Supply | 120 VAC, 20 amp GFCI-protected receptacle |
| Operating Conditions | |
| Temperature | –20 °C to 49 °C (–5 °F to 120 °F) |
| Relative Humidity | 0 to 98% |
| Capacity | 1/2" to 2" conduit, schedule 40 pipe |

## Bending Attachment Groups

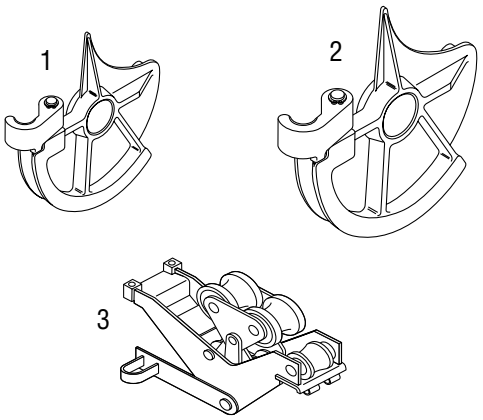
**RIGID**




**28007: 1/2" to 1-1/4" IMC**
**1/2" to 2" Rigid Steel**
**1/2" to 2" Schedule 40 Pipe**

| Key | UPC No. 78-3310- | Description |
|---|---|---|
| 1 | 00571 | Bending Shoe for 1/2" to 1-1/4" |
| 2 | 00936 | Roller Support Unit for 1/2" to 1-1/4" |
| 3 | 17937 | Bending Shoe for 1-1/2" to 2" |
| 4 | 17984 | Roller Support Unit for 1-1/2" to 2" |

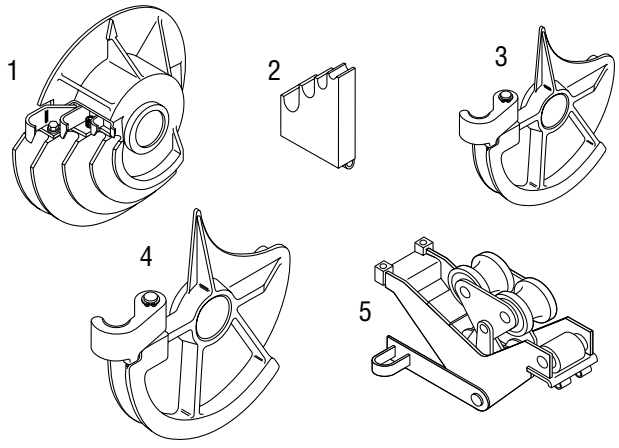
**IMC**




**26330: 1-1/2" to 2" IMC**

| Key | UPC No. 78-3310- | Description |
|---|---|---|
| 1 | 25263 | Bending Shoe for 1-1/2" |
| 2 | 25268 | Bending Shoe for 2" |
| 3 | 25273 | Roller Support Unit for 1-1/2" to 2" |
| | 23818 | Storage Box |

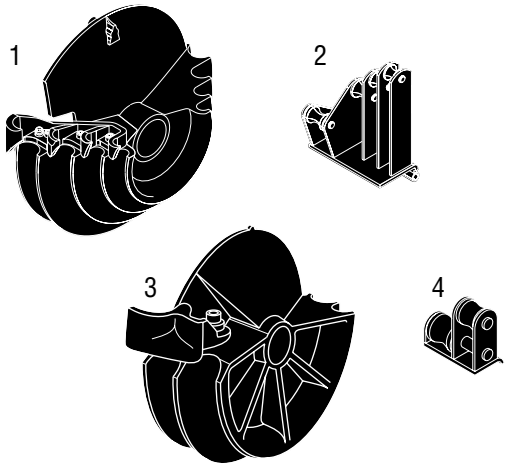
**EMT**




**23802: 1/2" to 2" EMT**

| Key | UPC No. 78-3310- | Description |
|---|---|---|
| 1 | 17944 | Bending Shoe for 1/2" to 1-1/4" |
| 2 | 17986 | Roller Support Unit for 1/2" to 1-1/4" |
| 3 | 23499 | Bending Shoe for 1-1/2" |
| 4 | 23505 | Bending Shoe for 2" |
| 5 | 23541 | Roller Support Unit for 1-1/2" to 2" |
| | 23818 | Storage Box |

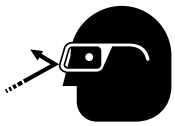
**PVC-COATED RIGID**




**37279: 1-1/2" to 2" 40 Mil PVC-Coated Rigid**

| Key | UPC No. 78-3310- | Description |
|---|---|---|
| 1 | 00573 | Bending Shoe for 1/2" to 1-1/4" |
| 2 | 00946 | Roller Support Unit for 1/2" to 1-1/4" |
| 3 | 37281 | Bending Shoe for 1-1/2" to 2" |
| 4 | 37282 | Roller Support Unit for 1-1/2" to 2" |
| | 23818 | Storage Box |

## Setup



**⚠WARNING**

Wear eye protection when operating or servicing this tool.

Failure to wear eye protection can result in serious eye injury from flying debris.

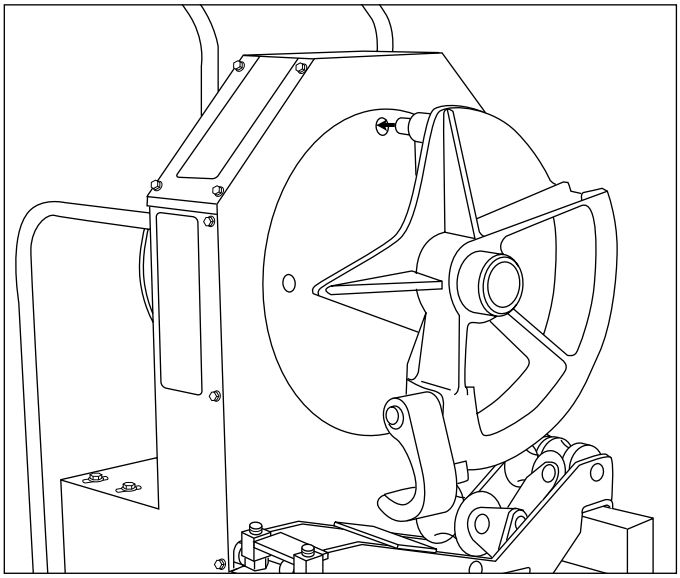
**⚠WARNING**

Unplug the bender before changing accessories. Accidental start-up can result in serious injury.

1. Slide the appropriate bending shoe onto the shaft of the main sprocket, as shown. Align the four drive studs on the back of the shoe with the four holes in the main sprocket.

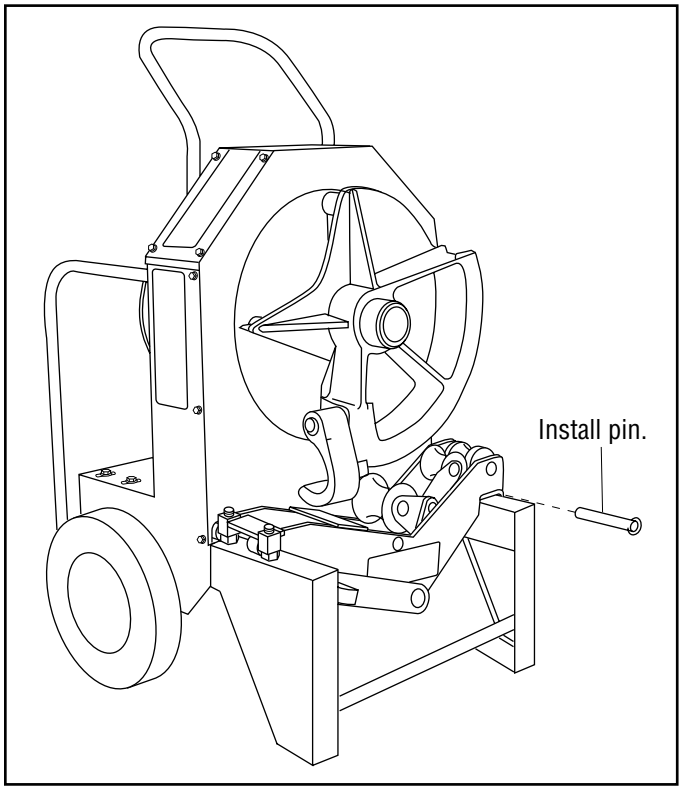
   *Note: 1-1/2" and 2" EMT and IMC bending shoes have only three drive studs.*

**Installing a Bending Shoe**



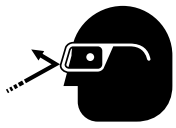
2. Mount the appropriate support unit onto the leg of the bender and install the hinge pin, as shown.

**Roller Support Unit Installed**




3. Mark the conduit. See the decals on the bender or the Additional Bending Instructions section of this manual.
4. Place the bender in either the vertical or horizontal bending position.

## Operation



**⚠WARNING**

Wear eye protection when operating or servicing this tool.

Failure to wear eye protection can result in serious eye injury from flying debris.



**⚠WARNING**

Pinch points:

Keep hands away from bending shoe, rollers and conduit when bender is in use.

Failure to observe this warning can result in severe injury or death.

**⚠WARNING**

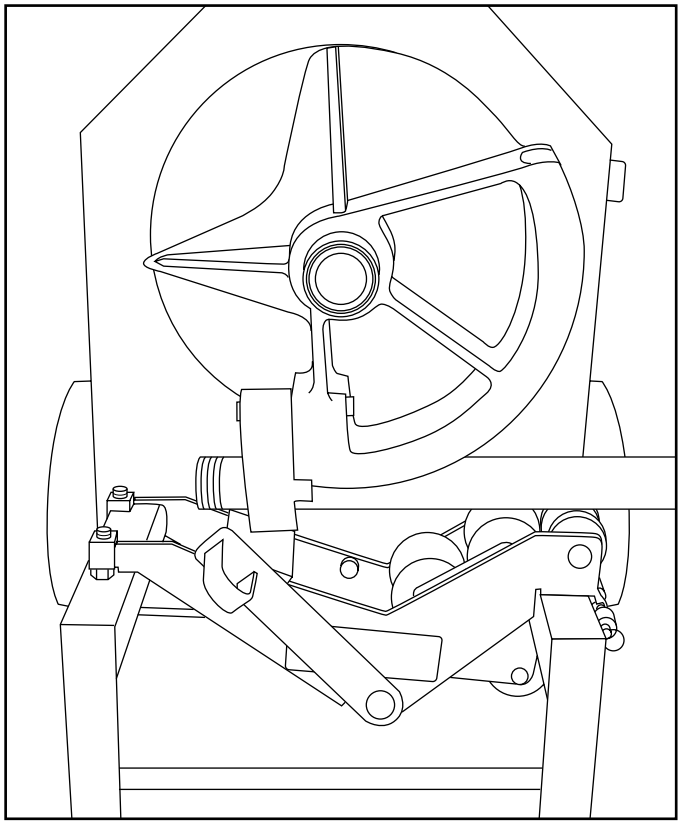
Do not operate the bender while wearing loose clothing. Loose clothing can get caught in moving parts.

Failure to observe this warning can result in severe injury or death.

**BENDING CONDUIT**

1. Plug the cord into an appropriate receptacle. See Grounding Instructions.
2. Press BEND or UNLOAD until the shoe is 5° to 10° before the 0° starting point.
3. Load the conduit so that the bending mark is aligned with the front edge of the shoe hook, as illustrated.

**Loading the Conduit**



4. See the instruction decal for the appropriate bend angle.

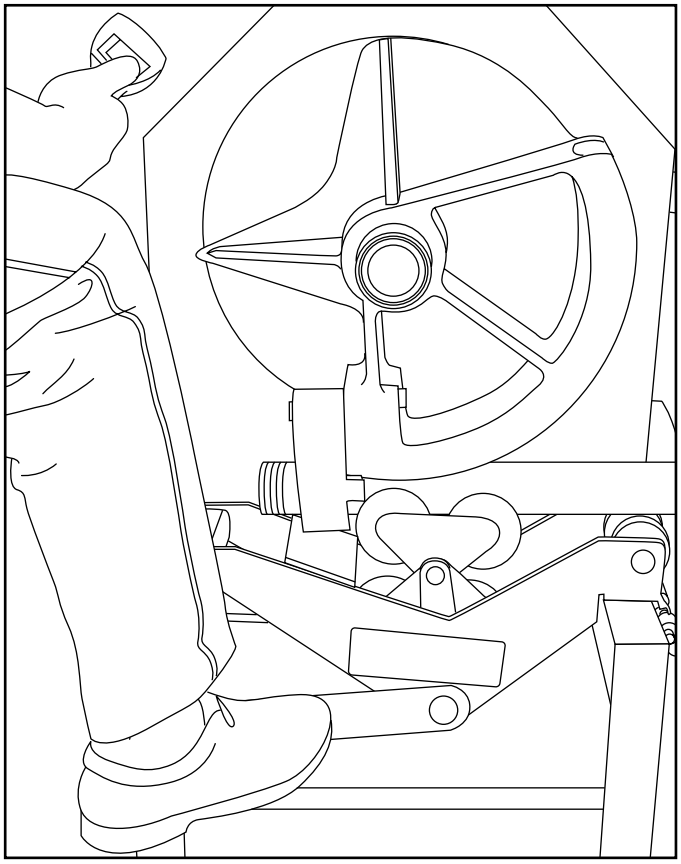
## Operation (cont'd)

5. Bend the conduit:

   **If bending 1-1/2" to 2" EMT or IMC:**

   a. Place one foot on the loading pedal, as shown.

**Engaging the Loading Pedal (for 1-1/2" to 2" EMT or IMC Only)**



   b. Press and hold BEND. The bender will pull up the roller support. When the roller support contacts the stop, remove your foot from the loading pedal.

   c. Release the switch as you approach the desired angle of bend.

   d. Press BEND momentarily until the bend is complete.

   **If bending any other size or type of conduit:**

   a. Press and hold BEND.

   b. Release the switch as you approach the desired angle of bend.

   c. Press BEND momentarily until the bend is complete.

6. Press UNLOAD. The shoe will rotate backward.

   *Note: If bending EMT or IMC, the roller support unit will drop to its original position.*

7. Twist the conduit to release it from the hook. Remove the conduit.

8. Press and hold UNLOAD until the shoe has rotated back to 0°.

## Operation (cont'd)

### ADJUSTING THE SQUEEZE

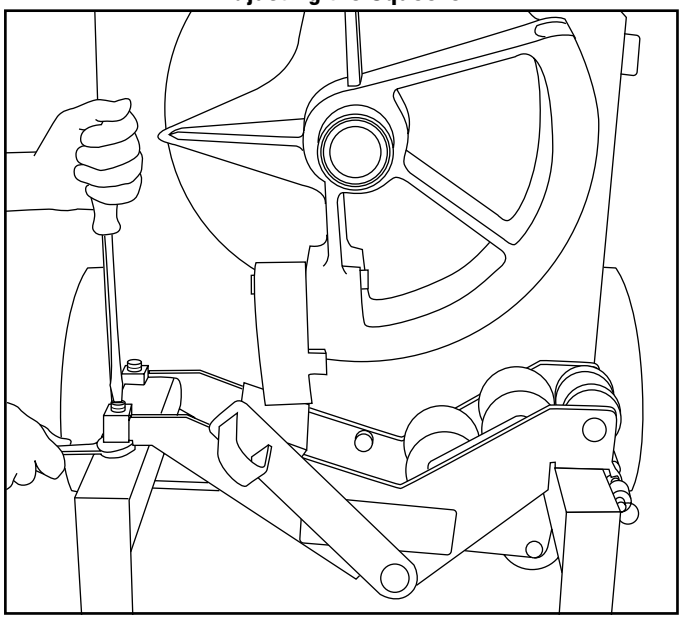
When bending 1-1/2" to 2" EMT or IMC, the roller support must be engaged so that it contacts the conduit; the pressure against the conduit is the "squeeze."

Due to variations in conduit, the standard adjustment may provide too much or too little squeeze. If the conduit develops excessive side marking when bent, the squeeze is set too high. If the conduit becomes excessively oval or wrinkled, the squeeze is set too low.

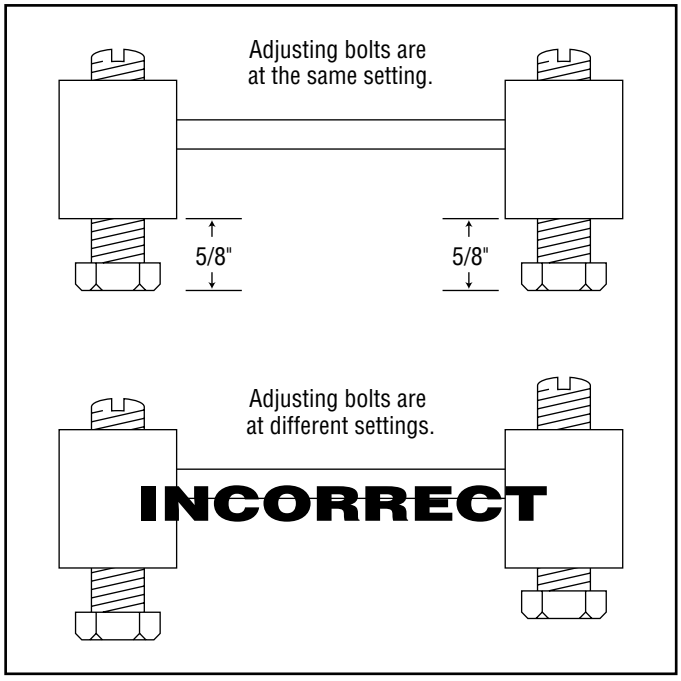
1. Use a screwdriver to loosen the set screws.
2. Use a wrench to rotate both adjusting bolts 1/2 turn clockwise to INCREASE squeeze or 1/2 turn counterclockwise to DECREASE squeeze.

   *Note: In order to distribute the load evenly, adjust both bolts to the same setting. See the illustration.*
3. Tighten the set screws.

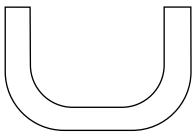
**Adjusting the Squeeze**



**Standard Squeeze Setting**

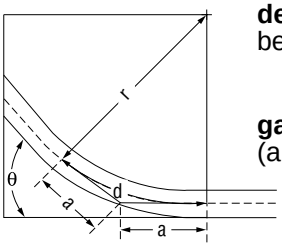


## Illustrated Bending Glossary



**back-to-back bend** — any U-shaped bend formed by two parallel 90° bends with a straight section of conduit or pipe between the bends.

**center-to-center distance** — the distance between the successive bends that make up an offset or a three-bend saddle.



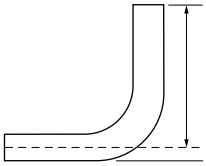

**developed length** — the actual length of pipe that will be bent; see distance “d” in the illustration at left.

**gain** — the difference between the straight-line distance (a + a) and the shorter radial distance, (d) where:

θ = angle of bend

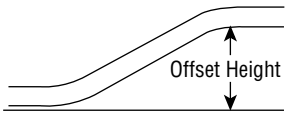
r = the centerline bending radius of the bending shoe

**kick** — single bend of less than 90°

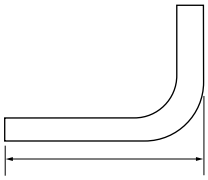


**leg length** — the distance from the end of a straight section of conduit or pipe to the bend; measured from the end to the outside edge of the conduit or pipe.

**offset bend** — two opposite bends with the same degree of bend; used to avoid an obstruction.



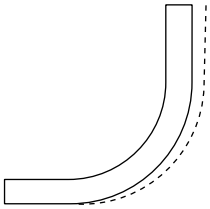

**offset height** — the distance between the two legs of an offset bend, measured perpendicular to the two legs; also called amount of offset and depth of offset.



**rise** — the distance from the end of a straight section of conduit or pipe to the bend; measured from the end to the center line of the conduit or pipe. Also called stub or stub-up.

**saddle** — a three-bend or four-bend combination; used to avoid an obstruction.

**shrink** — the amount of conduit “lost” when laying out an offset bend working toward an obstruction; see the explanation under Offset Bending in this manual.



**springback** — the amount, measured in degrees, that a conduit or pipe tends to straighten after being bent.

# Bending Instructions

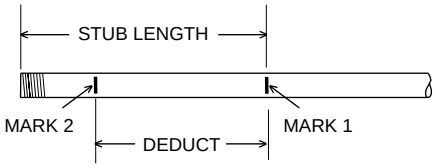
### 90° STUBS

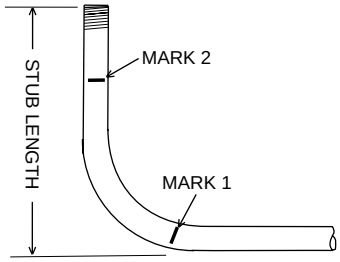
1. Measure the length of the required stub.
2. See the Minimum Stub Length formula on the Deduct Table. The required stub must be equal to or longer than the Minimum Stub Length.
3. Measure and mark the stub length on the conduit. This is Mark 1. Subtract the Deduct from this mark and make a new mark. This is Mark 2.
4. Align Mark 2 with the front edge of the hook and bend the conduit.

*Notes:*

*When the operator presses "UNLOAD", the conduit may spring back a few degrees. Compensate by overbending as shown in the Scale Reading Table.*

*The rigid shoe can make a 180° bend in one shot. All other shoes bend to 90° maximum.*




### Deduct Table

| SIZE | | 1/2 | 3/4 | 1 | 1-1/4 | 1-1/2 | 2 |
|---|---|---|---|---|---|---|---|
| DEDUCT | RIGID/PVC | 7-1/2 | 9 | 11 | 14 | 14-1/4 | 16-1/8 |
| | EMT | 7 | 8-7/8 | 10-3/4 | 13-1/8 | 13-7/8 | 15-3/8 |
| | IMC | 7-1/2 | 9 | 11 | 14 | 13-3/4 | 15-1/4 |
| MINIMUM STUB LENGTH = DEDUCT PLUS 2 INCHES | | | | | | | |

**Figures are approximate**

### Scale Reading Table

| | RIGID | | | | | EMT | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SIZE | 15° | 30° | 45° | 60° | 90° | 15° | 30° | 45° | 60° | 90° |
| 1/2 | 18-3/4 | 35 | 50 | 66-1/4 | 96-1/4 | 16-1/4 | 32-1/2 | 47-1/2 | 63-3/4 | 95 |
| 3/4 | 17-1/2 | 32-1/2 | 47-1/2 | 63-3/4 | 95 | 17-1/2 | 33-3/4 | 48-3/4 | 63-3/4 | 95 |
| 1 | 17-1/2 | 33-3/4 | 48-3/4 | 65 | 95 | 17-1/2 | 32-1/2 | 48-3/4 | 65 | 95 |
| 1-1/4 | 18-3/4 | 33-3/4 | 48-3/4 | 63-3/4 | 95 | 17-1/2 | 33-3/4 | 48-3/4 | 65 | 95 |
| 1-1/2 | 18-3/4 | 33-3/4 | 48-3/4 | 65 | 95 | 16-1/4 | 31-1/4 | 46-1/4 | 61-1/4 | 92-1/2 |
| 2 | 20 | 35 | 48-3/4 | 63-3/4 | 96-1/4 | 17-1/2 | 33-3/4 | 48-3/4 | 63-3/4 | 95 |

| | IMC | | | | | PVC-Coated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SIZE | 15° | 30° | 45° | 60° | 90° | 15° | 30° | 45° | 60° | 90° |
| 1/2 | 20 | 36-1/4 | 51-1/4 | 67-1/2 | 98-3/4 | 17-1/2 | 33-3/4 | 48-3/4 | 65 | 95 |
| 3/4 | 20 | 36-1/4 | 51-1/4 | 67-1/2 | 97-1/2 | 17-1/2 | 33-3/4 | 48-3/4 | 63-3/4 | 95 |
| 1 | 21-1/4 | 36-1/4 | 51-1/4 | 66-1/4 | 97-1/2 | 17-1/2 | 32-1/2 | 47-1/2 | 63-3/4 | 95 |
| 1-1/4 | 18-3/4 | 33-3/4 | 50 | 65 | 96-1/4 | 18-3/4 | 33-3/4 | 50 | 65 | 95 |
| 1-1/2 | 17-1/2 | 33-3/4 | 48-3/4 | 63-3/4 | 95 | 18-3/4 | 33-3/4 | 48-3/4 | 65 | 95 |
| 2 | 20 | 35 | 50 | 65 | 96-1/4 | 20 | 35 | 48-3/4 | 63-3/4 | 96-1/4 |

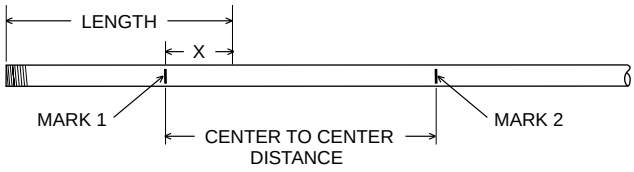
**Figures are approximate**

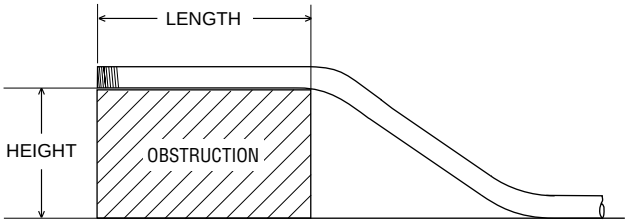
## Bending Instructions (cont'd)

### Offsets

1. Measure the height and length of the obstruction. Select the angle to be used.
2. See the Offset Table. The height of the obstruction must be equal to or greater than the minimum offset.
3. Refer to the X Table to find the X dimension. Refer to the Offset Table to find the center-to-center distance.

   *Note: If the center-to-center distance is not shown, calculate it by using the multipliers shown in the Offset Table.*
4. Mark the conduit as shown.
5. Insert the conduit into the bender. Align Mark 1 with the front edge of the hook and bend the conduit.
6. Align Mark 2 with the front edge of the hook. Without removing the conduit from the bender, rotate the conduit 180°. Make the second bend.




### Offset Table

| OFFSET ➤ | | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 15° | Max Conduit Size | 3/4 | 1-1/2 | 2 | 2 | |
| | Center-to-Center | 7-3/4 | 15-7/16 | 23-3/16 | 30-15/16 | 38-5/8 |
| 30° | Max Conduit Size | | 3/4 | 1 | 1-1/2 | 2 |
| | Center-to-Center | | 8 | 12 | 16 | 20 |
| 45° | Max Conduit Size | | | 1/2 | 1 | 1-1/4 |
| | Center-to-Center | | | 8-1/2 | 11-5/16 | 14-1/8 |

| OFFSET ➤ | | 12 | 14 | 16 | 18 | 20 | 22 |
|---|---|---|---|---|---|---|---|
| 15° | Max Conduit Size | 2 | | | | | |
| | Center-to-Center | 46-3/8 | 54-1/16 | 61-13/16 | 69-9/16 | 77-1/4 | 85 |
| 30° | Max Conduit Size | 2 | | | | | |
| | Center-to-Center | 24 | 28 | 32 | 36 | 40 | 44 |
| 45° | Max Conduit Size | 1-1/2 | 2 | 2 | | | |
| | Center-to-Center | 16-15/16 | 19-13/16 | 22-5/8 | 25-7/16 | 28-1/4 | 31-1/8 |

| CENTER-TO-CENTER DISTANCE = OFFSET HEIGHT x MULTIPLIER | | | | | |
|---|---|---|---|---|---|
| OFFSET ANGLE | 10° | 15° | 22-1/2° | 30° | 45° |
| MULTIPLIER | 5.8 | 3.9 | 2.6 | 2.0 | 1.4 |

**Figures are approximate**

### X Table

| CONDUIT SIZE | 1/2 | 3/4 | 1 | 1-1/4 | 1-1/2 | 2 |
|---|---|---|---|---|---|---|
| "X" | 3-1/16 | 3-1/16 | 3-3/16 | 4 | 4-1/4 | 4-1/2 |

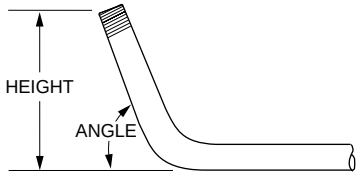
**Figures are approximate**

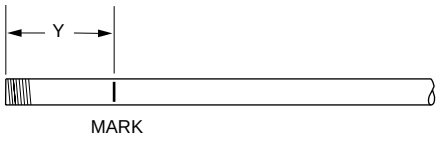
## Additional Bending Instructions

The following drawings and bending tables are intended to provide the information necessary to accomplish the most common types of bends. The Bending Tables contain conduit marking information.

### STUBS

1. Select the size and type of conduit. Determine the height of stub and the angle to be used.
2. Find the table that corresponds to the size and type of conduit selected in Step 1.
3. Under the column labeled ANGLE, find the appropriate angle.
4. Find the row labeled Y. In the row at the top of the page, find the height (H) of the stub. The number shown at the intersection of row Y and column H is the distance Y. Place the bending mark Y inches from the end of the conduit.
5. Bend the conduit.



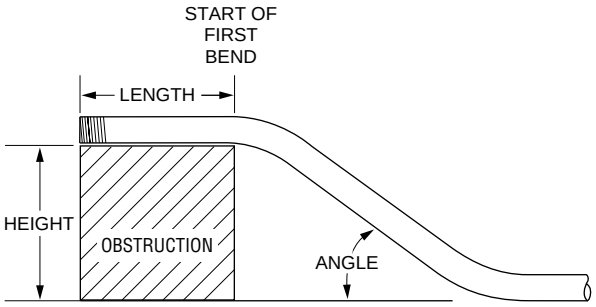

### OFFSETS

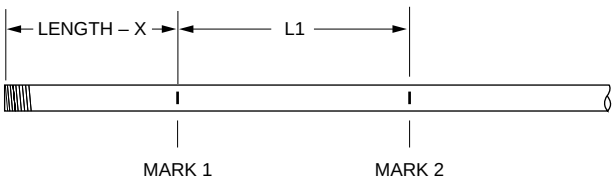
An offset is used to route the conduit around an obstruction. To make an offset, two equal bends are required. The distance between the two bends is the center-to-center distance.

When working past an obstruction, it is necessary to determine the location of the first bend. The center-to-center distance is then used to determine the location of the second bend. When working toward an obstruction, it is necessary to determine the location of the second bend. The center-to-center distance is then used to determine the location of the first bend.

#### Working Past an Obstruction

1. Select the size and type of conduit. Measure the height of the obstruction and the distance labeled LENGTH. Determine the angle to be used.
2. Find the table that corresponds to the size and type of conduit selected in Step 1.
3. To the right of the size and type of conduit, find the dimension labeled X. Subtract X from LENGTH. Place the first bending mark this distance from the end of the conduit.
4. Under the column labeled ANGLE, find the appropriate angle. Find the row labeled L1. In the row at the top of the page, find the height (H) of the offset. The number shown at the intersection of row L1 and column H is L1. Place the second bending mark L1 inches from the first bending mark.
5. Bend the conduit.

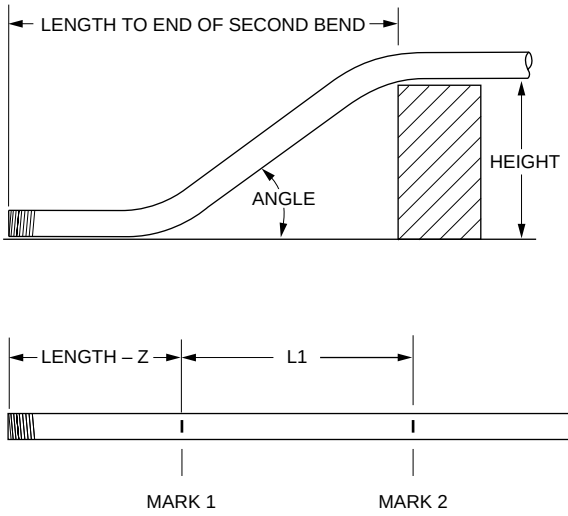


## Additional Bending Instructions (cont'd)

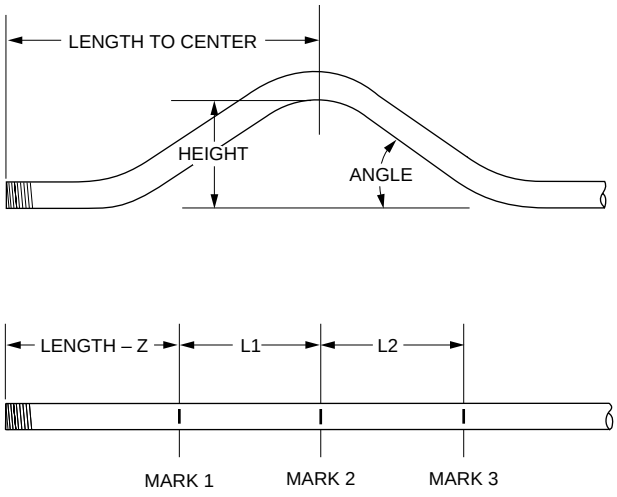
### Working Toward an Obstruction

1. Select the size and type of conduit. Measure the height of the obstruction and the distance labeled LENGTH TO END OF SECOND BEND. Determine the angle to be used.
2. Find the table that corresponds to the size and type of conduit selected in Step 1.
3. Under the column labeled ANGLE, find the appropriate angle. Find the row labeled Z. In the row at the top of the page, find the height (H) of the offset. The number shown at the intersection of the Z row and the H column is Z. Subtract Z from LENGTH TO THE END OF SECOND BEND. Place the first bending mark this distance from the end of the conduit.
4. In the same column, find the row labeled L1. Place the second bending mark L1 inches from the first bending mark.
5. Bend the conduit.




### THREE-BEND SADDLE

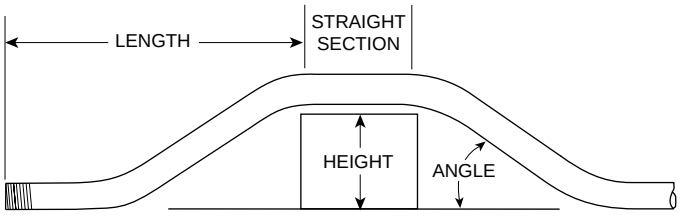
1. Select the size and type of conduit. Measure the height of the obstruction and the distance from the end of the conduit to the center (LENGTH TO CENTER) of the bend. Determine the angle to be used.
2. Find the table that corresponds to the size and type of conduit selected in Step 1.
3. Under the column labeled ANGLE, find the appropriate angle. Find the row labeled Z. In the row at the top of the page, find the height (H) of the offset. The number shown at the intersection of the Z row and the appropriate H column is Z. Subtract Z from the LENGTH TO CENTER. Place the first bending mark this distance from the end of the conduit.
4. In the same column, find the row labeled L1. Place the second bending mark L1 inches from the first bending mark.
5. In the same column, find the row labeled L2. Place the third bending mark L2 inches from the second bending mark.
6. Bend the conduit.

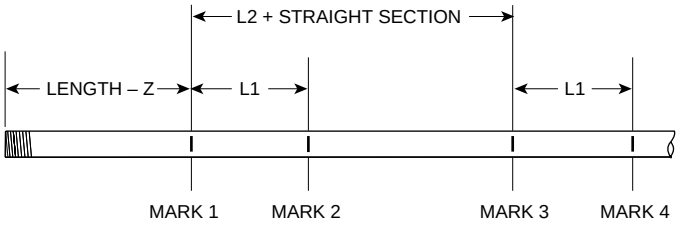


## Additional Bending Instructions (cont'd)

### FOUR-BEND SADDLE

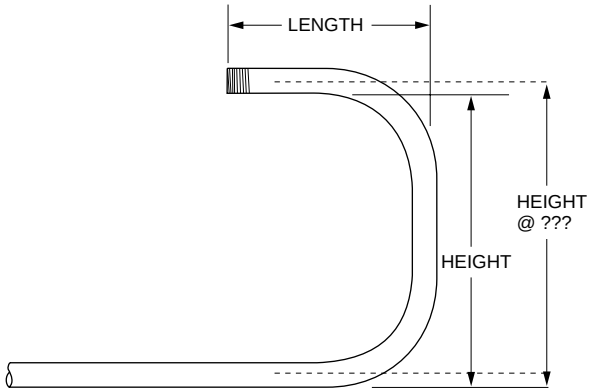
1. Select the size and type of conduit. Measure the height of the obstruction, the distance labeled LENGTH, and the distance labeled STRAIGHT SECTION. Determine the angle to be used.
2. Find the table that corresponds to the size and type of conduit selected in Step 1.
3. Under the column labeled ANGLE, find the appropriate angle. Find the row labeled Z. In the row at the top of the page, find the height (H) of the offset. The number shown at the intersection of the Z row and the appropriate H column is Z. Subtract Z from the LENGTH. Place the first bending mark this distance from the end of the conduit.
4. In the same column, find the row labeled L1. Place the second bending mark L1 inches from the first bending mark.
5. In the same column, find the row labeled L2. Add L2 to the STRAIGHT SECTION. Place the third bending mark this distance from the first bending mark.
6. Make the final bending mark L1 inches from the third bending mark.
7. Bend the conduit.

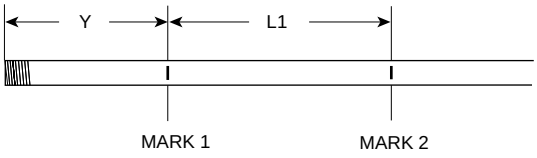



### U-BENDS

1. Select the size and type of conduit. Determine the LENGTH and the HEIGHT.
2. Find the table that corresponds to the size and type of conduit selected in Step 1.
3. Under the column labeled ANGLE, find 90°.
4. Find the row labeled Y. In the row at the top of the page, find the height (H) that corresponds to the LENGTH. The number shown at the intersection of the Y row and the appropriate H column is the distance Y. Place the bending mark Y inches from the end of the conduit.
5. Find the row labeled L1, and go to the right to find the height (H) that corresponds to the HEIGHT.
6. The number shown at the intersection of the L1 row and the appropriate H column is L1. Place the second bending mark L1 inches from the first mark.
7. Bend the conduit.



# Additional Bending Tables

| | DIM | ANGLE | 2" | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 24" | 36" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1/2" EMT** | | | | | | | | | | | | |
| | Y | 15 | 3.74 | 11.47 | 19.20 | 26.92 | 34.65 | 42.38 | 53.97 | 65.56 | 88.74 | 135.11 |
| | L1 | 15 | 7.72 | 15.45 | 23.18 | 30.90 | 38.63 | 46.36 | 57.95 | 69.54 | 92.72 | 139.09 |
| | L2 | 15 | 8.94 | 16.66 | 24.39 | 32.12 | 39.84 | 47.57 | 59.16 | 70.75 | 93.94 | 140.30 |
| | Z | 15 | 10.70 | 18.16 | 25.62 | 33.09 | 40.55 | 48.02 | 59.21 | 70.41 | 92.80 | 137.59 |
| MINIMUM H = 0.84 | | | | | | | | | | | | |
| | Y | 22.5 | 1.37 | 6.60 | 11.82 | 17.05 | 22.28 | 27.50 | 35.34 | 43.18 | 58.86 | 90.22 |
| | L1 | 22.5 | 5.20 | 10.43 | 15.65 | 20.88 | 26.11 | 31.33 | 39.17 | 47.01 | 62.69 | 94.05 |
| | L2 | 22.5 | 7.02 | 12.25 | 17.48 | 22.70 | 27.93 | 33.16 | 41.00 | 48.83 | 64.51 | 95.87 |
| | Z | 22.5 | 8.68 | 13.51 | 18.34 | 23.17 | 28.00 | 32.83 | 40.07 | 47.31 | 61.80 | 90.77 |
| MINIMUM H = 1.48 | | | | | | | | | | | | |
| | Y | 30 | 0.04 | 4.04 | 8.04 | 12.04 | 16.04 | 20.04 | 26.04 | 32.04 | 44.04 | 68.04 |
| | L1 | 30 | | 7.94 | 11.94 | 15.94 | 19.94 | 23.94 | 29.94 | 35.94 | 47.94 | 71.94 |
| | L2 | 30 | | 10.37 | 14.37 | 18.37 | 22.37 | 26.37 | 32.37 | 38.37 | 50.37 | 74.37 |
| | Z | 30 | | 11.42 | 14.89 | 18.35 | 21.82 | 25.28 | 30.48 | 35.67 | 46.07 | 66.85 |
| MINIMUM H = 2.25 | | | | | | | | | | | | |
| | Y | 45 | | 1.23 | 4.05 | 6.88 | 9.71 | 12.54 | 16.78 | 21.02 | 29.51 | 46.48 |
| | L1 | 45 | | | 8.29 | 11.11 | 13.94 | 16.77 | 21.01 | 25.26 | 33.74 | 50.71 |
| | L2 | 45 | | | 11.93 | 14.76 | 17.59 | 20.42 | 24.66 | 28.90 | 37.39 | 54.36 |
| | Z | 45 | | | 11.85 | 13.85 | 15.85 | 17.85 | 20.85 | 23.85 | 29.85 | 41.85 |
| MINIMUM H = 4.14 | | | | | | | | | | | | |
| | Y | 60 | | | 1.83 | 4.14 | 6.45 | 8.76 | 12.22 | 15.69 | 22.62 | 36.47 |
| | L1 | 60 | | | | 8.74 | 11.05 | 13.36 | 16.82 | 20.29 | 27.21 | 41.07 |
| | L2 | 60 | | | | 13.60 | 15.91 | 18.22 | 21.68 | 25.14 | 32.07 | 45.93 |
| | Z | 60 | | | | 11.99 | 13.14 | 14.30 | 16.03 | 17.76 | 21.22 | 28.15 |
| MINIMUM H = 6.38 | | | | | | | | | | | | |
| | Y | 90 | | | | 1.00 | 3.00 | 5.00 | 8.00 | 11.00 | 17.00 | 29.00 |
| | L1 | 90 | | | | | | 10.01 | 13.01 | 16.01 | 22.01 | 34.01 |
| | L2 | 90 | | | | | | 17.30 | 20.30 | 23.30 | 29.30 | 41.30 |
| | Z | 90 | | | | | | 11.29 | 11.29 | 11.29 | 11.29 | 11.29 |
| MINIMUM H = 11.29 | | | | | | | | | | | | |
| **3/4" EMT** | | | | | | | | | | | | |
| | Y | 15 | 2.35 | 10.07 | 17.80 | 25.53 | 33.26 | 40.98 | 52.58 | 64.17 | 87.35 | 133.71 |
| | L1 | 15 | 7.72 | 15.45 | 23.17 | 30.90 | 38.63 | 46.36 | 57.95 | 69.54 | 92.72 | 139.08 |
| | L2 | 15 | 9.17 | 16.90 | 24.62 | 32.35 | 40.08 | 47.81 | 59.40 | 70.99 | 94.17 | 140.54 |
| | Z | 15 | 11.79 | 19.26 | 26.72 | 34.19 | 41.65 | 49.11 | 60.31 | 71.51 | 93.90 | 138.68 |
| MINIMUM H = 1.12 | | | | | | | | | | | | |
| | Y | 22.5 | 0.05 | 5.28 | 10.50 | 15.73 | 20.95 | 26.18 | 34.02 | 41.86 | 57.54 | 88.90 |
| | L1 | 22.5 | 5.20 | 10.42 | 15.65 | 20.88 | 26.10 | 31.33 | 39.17 | 47.01 | 62.69 | 94.04 |
| | L2 | 22.5 | 7.37 | 12.60 | 17.83 | 23.05 | 28.28 | 33.50 | 41.34 | 49.18 | 64.86 | 96.22 |
| | Z | 22.5 | 9.90 | 14.73 | 19.56 | 24.39 | 29.22 | 34.04 | 41.29 | 48.53 | 63.02 | 91.99 |
| MINIMUM H = 1.94 | | | | | | | | | | | | |
| | Y | 30 | | 2.72 | 6.72 | 10.72 | 14.72 | 18.72 | 24.72 | 30.72 | 42.72 | 66.72 |
| | L1 | 30 | | 7.93 | 11.93 | 15.93 | 19.93 | 23.93 | 29.93 | 35.93 | 47.93 | 71.93 |
| | L2 | 30 | | 10.83 | 14.83 | 18.83 | 22.83 | 26.83 | 32.83 | 38.83 | 50.83 | 74.83 |
| | Z | 30 | | 12.77 | 16.23 | 19.70 | 23.16 | 26.62 | 31.82 | 37.02 | 47.41 | 68.19 |
| MINIMUM H = 2.92 | | | | | | | | | | | | |
| | Y | 45 | | | 2.67 | 5.50 | 8.33 | 11.15 | 15.40 | 19.64 | 28.12 | 45.09 |
| | L1 | 45 | | | 8.25 | 11.08 | 13.90 | 16.73 | 20.97 | 25.22 | 33.70 | 50.67 |
| | L2 | 45 | | | 12.60 | 15.43 | 18.25 | 21.08 | 25.33 | 29.57 | 38.05 | 55.02 |
| | Z | 45 | | | 13.46 | 15.46 | 17.46 | 19.46 | 22.46 | 25.46 | 31.46 | 43.46 |
| MINIMUM H = 5.27 | | | | | | | | | | | | |
| | Y | 60 | | | 0.33 | 2.64 | 4.95 | 7.26 | 10.72 | 14.18 | 21.11 | 34.97 |
| | L1 | 60 | | | | | 10.95 | 13.26 | 16.72 | 20.19 | 27.12 | 40.97 |
| | L2 | 60 | | | | | 16.75 | 19.06 | 22.53 | 25.99 | 32.92 | 46.78 |
| | Z | 60 | | | | | 15.04 | 16.20 | 17.93 | 19.66 | 23.12 | 30.05 |
| MINIMUM H = 8.03 | | | | | | | | | | | | |
| | Y | 90 | | | | | 1.13 | 3.13 | 6.13 | 9.13 | 15.13 | 27.13 |
| | L1 | 90 | | | | | | | 12.62 | 15.62 | 21.62 | 33.62 |
| | L2 | 90 | | | | | | | 21.32 | 24.32 | 30.32 | 42.32 |
| | Z | 90 | | | | | | | 13.95 | 13.95 | 13.95 | 13.95 |
| MINIMUM H = 13.95 | | | | | | | | | | | | |

## Additional Bending Tables (cont'd)

| | DIM | ANGLE | 2" | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 24" | 36" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1" EMT** | | | | | | | | | | | | |
| | Y | 15 | 1.35 | 9.07 | 16.80 | 24.53 | 32.26 | 39.98 | 51.57 | 63.16 | 86.35 | 132.71 |
| | L1 | 15 | 7.72 | 15.44 | 23.17 | 30.90 | 38.63 | 46.35 | 57.95 | 69.54 | 92.72 | 139.08 |
| | L2 | 15 | 9.54 | 17.26 | 24.99 | 32.72 | 40.45 | 48.17 | 59.76 | 71.36 | 94.54 | 140.90 |
| | Z | 15 | 12.51 | 19.98 | 27.44 | 34.91 | 42.37 | 49.83 | 61.03 | 72.23 | 94.62 | 139.40 |
| MINIMUM H = 1.31 | | | | | | | | | | | | |
| | Y | 22.5 | | 4.33 | 9.56 | 14.78 | 20.01 | 25.24 | 33.07 | 40.91 | 56.59 | 87.95 |
| | L1 | 22.5 | | 10.42 | 15.64 | 20.87 | 26.10 | 31.32 | 39.16 | 47.00 | 62.68 | 94.04 |
| | L2 | 22.5 | | 13.15 | 18.37 | 23.60 | 28.82 | 34.05 | 41.89 | 49.73 | 65.41 | 96.77 |
| | Z | 22.5 | | 15.64 | 20.47 | 25.30 | 30.13 | 34.96 | 42.20 | 49.44 | 63.93 | 92.90 |
| MINIMUM H = 2.29 | | | | | | | | | | | | |
| | Y | 30 | | 1.75 | 5.75 | 9.75 | 13.75 | 17.75 | 23.75 | 29.75 | 41.75 | 65.75 |
| | L | 30 | | 7.91 | 11.91 | 15.91 | 19.91 | 23.91 | 29.91 | 35.91 | 47.91 | 71.91 |
| | L2 | 30 | | 11.55 | 15.55 | 19.55 | 23.55 | 27.55 | 33.55 | 39.55 | 51.55 | 75.55 |
| | Z | 30 | | 13.87 | 17.34 | 20.80 | 24.27 | 27.73 | 32.92 | 28.12 | 48.51 | 69.30 |
| MINIMUM H = 3.47 | | | | | | | | | | | | |
| | Y | 45 | | | 1.56 | 4.39 | 7.22 | 10.05 | 14.29 | 18.53 | 27.02 | 43.99 |
| | L1 | 45 | | | | 11.01 | 13.84 | 16.67 | 20.91 | 25.16 | 33.64 | 50.61 |
| | L2 | 45 | | | | 16.47 | 19.30 | 22.13 | 26.37 | 30.62 | 39.10 | 56.07 |
| | Z | 45 | | | | 16.98 | 18.98 | 20.98 | 23.98 | 26.98 | 32.98 | 44.98 |
| MINIMUM H = 6.35 | | | | | | | | | | | | |
| | Y | 60 | | | | 1.33 | 3.64 | 5.95 | 9.42 | 12.88 | 19.81 | 33.67 |
| | L1 | 60 | | | | | 10.80 | 13.11 | 16.57 | 20.04 | 26.97 | 40.82 |
| | L2 | 60 | | | | | 18.08 | 20.39 | 23.85 | 27.32 | 34.24 | 48.10 |
| | Z | 60 | | | | | 17.02 | 18.17 | 19.91 | 21.64 | 25.10 | 32.03 |
| MINIMUM H = 9.74 | | | | | | | | | | | | |
| | Y | 90 | | | | | | 1.25 | 4.25 | 7.25 | 13.25 | 25.25 |
| | L1 | 90 | | | | | | | | 15.02 | 21.02 | 33.02 |
| | L2 | 90 | | | | | | | | 25.93 | 31.93 | 43.93 |
| | Z | 90 | | | | | | | | 17.12 | 17.12 | 17.12 |
| MINIMUM H = 17.12 | | | | | | | | | | | | |
| **1-1/4" EMT** | | | | | | | | | | | | |
| | Y | 15 | 0.26 | 7.99 | 15.72 | 23.45 | 31.17 | 38.90 | 50.49 | 62.08 | 85.27 | 131.63 |
| | L1 | 15 | 7.71 | 15.44 | 23.17 | 30.90 | 38.62 | 46.35 | 57.94 | 69.53 | 92.72 | 139.08 |
| | L2 | 15 | 10.07 | 17.80 | 25.52 | 33.25 | 40.98 | 48.71 | 60.30 | 71.89 | 95.07 | 141.44 |
| | Z | 15 | 13.20 | 20.66 | 28.12 | 35.59 | 43.05 | 50.52 | 61.71 | 72.91 | 95.30 | 140.09 |
| MINIMUM H = 1.48 | | | | | | | | | | | | |
| | Y | 22.5 | | 3.33 | 8.55 | 13.78 | 19.01 | 24.23 | 32.07 | 39.91 | 55.59 | 86.95 |
| | L1 | 22.5 | | 10.41 | 15.63 | 20.86 | 26.09 | 31.31 | 39.15 | 46.99 | 62.67 | 94.03 |
| | L2 | 22.5 | | 13.94 | 19.17 | 24.40 | 29.62 | 34.85 | 42.69 | 50.53 | 66.21 | 97.56 |
| | Z | 22.5 | | 16.60 | 21.43 | 26.26 | 31.09 | 35.91 | 43.16 | 50.40 | 64.89 | 93.86 |
| MINIMUM H = 2.66 | | | | | | | | | | | | |
| | Y | 30 | | 0.72 | 4.72 | 8.72 | 12.72 | 16.72 | 22.72 | 28.72 | 40.72 | 64.72 |
| | L1 | 30 | | | 11.89 | 15.89 | 19.89 | 23.89 | 29.89 | 35.89 | 47.89 | 71.89 |
| | L2 | 30 | | | 16.61 | 20.61 | 24.61 | 28.61 | 34.61 | 40.61 | 52.61 | 76.61 |
| | Z | 30 | | | 18.58 | 22.04 | 25.51 | 28.97 | 34.17 | 39.37 | 49.76 | 70.54 |
| MINIMUM H = 4.09 | | | | | | | | | | | | |
| | Y | 45 | | | 0.33 | 3.15 | 5.98 | 8.81 | 13.05 | 17.30 | 25.78 | 42.75 |
| | L1 | 45 | | | | 10.93 | 13.75 | 16.58 | 20.83 | 25.07 | 33.55 | 50.52 |
| | L2 | 45 | | | | 18.00 | 20.83 | 23.66 | 27.90 | 32.14 | 40.63 | 57.60 |
| | Z | 45 | | | | 18.82 | 20.82 | 22.82 | 25.82 | 28.82 | 34.82 | 46.82 |
| MINIMUM H = 7.65 | | | | | | | | | | | | |
| | Y | 60 | | | | | 2.11 | 4.42 | 7.89 | 11.35 | 18.28 | 32.14 |
| | L1 | 60 | | | | | | 12.89 | 16.35 | 19.82 | 26.74 | 40.60 |
| | L2 | 60 | | | | | | 22.32 | 25.79 | 29.25 | 36.18 | 50.04 |
| | Z | 60 | | | | | | 20.69 | 22.42 | 24.16 | 27.62 | 34.55 |
| MINIMUM H = 11.92 | | | | | | | | | | | | |
| | Y | 90 | | | | | | | 1.88 | 4.88 | 10.88 | 22.88 |
| | L1 | 90 | | | | | | | | | 20.13 | 32.13 |
| | L2 | 90 | | | | | | | | | 34.29 | 46.29 |
| | Z | 90 | | | | | | | | | 21.38 | 21.38 |
| MINIMUM H = 21.38 | | | | | | | | | | | | |

## Additional Bending Tables (cont'd)

| | DIM | ANGLE | 2" | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 24" | 36" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1-1/2" EMT** | | | | | | | | | | | | |
| | Y | 15 | | 6.26 | 13.99 | 21.72 | 29.44 | 37.17 | 48.76 | 60.35 | 83.53 | 129.90 |
| | L1 | 15 | 7.71 | 15.44 | 23.17 | 30.90 | 38.62 | 46.35 | 57.94 | 69.53 | 92.72 | 139.08 |
| | L2 | 15 | 9.95 | 17.68 | 25.40 | 33.13 | 40.86 | 48.58 | 60.18 | 71.77 | 94.95 | 141.31 |
| | Z | 15 | 14.42 | 21.88 | 29.35 | 36.81 | 44.28 | 51.74 | 62.94 | 74.13 | 96.53 | 141.31 |
| MINIMUM H = 1.81 | | | | | | | | | | | | |
| | Y | 22.5 | | 1.77 | 7.00 | 12.22 | 17.45 | 22.68 | 30.52 | 38.36 | 54.03 | 85.39 |
| | L1 | 22.5 | | 10.41 | 15.64 | 20.86 | 26.09 | 31.31 | 39.15 | 46.99 | 62.67 | 94.03 |
| | L2 | 22.5 | | 13.76 | 18.98 | 24.21 | 29.44 | 34.66 | 42.50 | 50.34 | 66.02 | 97.38 |
| | Z | 22.5 | | 17.76 | 22.59 | 27.42 | 32.25 | 37.07 | 44.32 | 51.56 | 66.04 | 95.02 |
| MINIMUM H = 3.11 | | | | | | | | | | | | |
| | Y | 30 | | | 3.26 | 7.26 | 11.26 | 15.26 | 21.26 | 27.26 | 39.26 | 63.26 |
| | L1 | 30 | | | 11.90 | 15.90 | 19.90 | 23.90 | 29.90 | 35.90 | 47.90 | 71.90 |
| | L2 | 30 | | | 16.36 | 20.36 | 24.36 | 28.36 | 34.36 | 40.36 | 52.36 | 76.36 |
| | Z | 30 | | | 19.67 | 23.14 | 26.60 | 30.07 | 35.26 | 40.46 | 50.85 | 71.64 |
| MINIMUM H = 4.64 | | | | | | | | | | | | |
| | Y | 45 | | | | 1.84 | 4.67 | 7.50 | 11.74 | 15.98 | 24.47 | 41.44 |
| | L1 | 45 | | | | | 13.78 | 16.60 | 20.85 | 25.09 | 33.57 | 50.54 |
| | L2 | 45 | | | | | 20.47 | 23.30 | 27.55 | 31.79 | 40.27 | 57.24 |
| | Z | 45 | | | | | 21.78 | 23.78 | 26.78 | 29.78 | 35.78 | 47.78 |
| MINIMUM H = 8.33 | | | | | | | | | | | | |
| | Y | 60 | | | | | 0.91 | 3.22 | 6.68 | 10.15 | 17.07 | 30.93 |
| | L1 | 60 | | | | | | | 16.40 | 19.87 | 26.80 | 40.65 |
| | L2 | 60 | | | | | | | 25.34 | 28.80 | 35.73 | 49.58 |
| | Z | 60 | | | | | | | 23.22 | 24.95 | 28.42 | 35.34 |
| MINIMUM H = 12.61 | | | | | | | | | | | | |
| | Y | 90 | | | | | | | 0.89 | 3.89 | 9.89 | 21.89 |
| | L1 | 90 | | | | | | | | | 20.34 | 32.34 |
| | L2 | 90 | | | | | | | | | 33.74 | 45.74 |
| | Z | 90 | | | | | | | | | 21.77 | 21.77 |
| MINIMUM H = 21.77 | | | | | | | | | | | | |
| **2" EMT** | | | | | | | | | | | | |
| | Y | 15 | | 5.15 | 12.87 | 20.60 | 28.33 | 36.05 | 47.65 | 59.24 | 82.42 | 128.78 |
| | L1 | 15 | 7.71 | 15.44 | 23.17 | 30.90 | 38.62 | 46.35 | 57.94 | 69.53 | 92.71 | 139.08 |
| | L2 | 15 | 10.19 | 17.92 | 25.64 | 33.37 | 41.10 | 48.83 | 60.42 | 72.01 | 95.19 | 141.56 |
| | Z | 15 | 14.77 | 22.24 | 29.70 | 37.17 | 44.63 | 52.10 | 63.29 | 74.49 | 96.88 | 141.66 |
| MINIMUM H = 1.89 | | | | | | | | | | | | |
| | Y | 22.5 | | 0.88 | 6.11 | 11.33 | 16.56 | 21.79 | 29.62 | 37.46 | 53.14 | 84.50 |
| | L1 | 22.5 | | 10.40 | 15.63 | 20.86 | 26.08 | 31.31 | 39.15 | 46.99 | 62.67 | 94.02 |
| | L2 | 22.5 | | 14.12 | 19.35 | 24.57 | 29.80 | 35.02 | 42.86 | 50.70 | 66.38 | 97.74 |
| | Z | 22.5 | | 18.24 | 23.07 | 27.90 | 32.73 | 37.55 | 44.80 | 52.04 | 66.52 | 95.50 |
| MINIMUM H = 3.28 | | | | | | | | | | | | |
| | Y | 30 | | | 2.45 | 6.45 | 10.45 | 14.45 | 20.45 | 26.45 | 38.45 | 62.45 |
| | L1 | 30 | | | 11.88 | 15.88 | 19.88 | 23.88 | 29.88 | 35.88 | 47.88 | 71.88 |
| | L2 | 30 | | | 16.84 | 20.84 | 24.84 | 28.84 | 34.84 | 40.84 | 52.84 | 76.84 |
| | Z | 30 | | | 20.28 | 23.75 | 27.21 | 30.67 | 35.87 | 41.07 | 51.46 | 72.24 |
| MINIMUM H = 4.94 | | | | | | | | | | | | |
| | Y | 45 | | | | 1.02 | 3.85 | 6.68 | 10.92 | 15.16 | 23.65 | 40.62 |
| | L1 | 45 | | | | | 13.74 | 16.56 | 20.81 | 25.05 | 33.53 | 50.50 |
| | L2 | 45 | | | | | 21.16 | 23.99 | 28.24 | 32.48 | 40.96 | 57.93 |
| | Z | 45 | | | | | 22.66 | 24.66 | 27.66 | 30.66 | 36.66 | 48.66 |
| MINIMUM H = 8.95 | | | | | | | | | | | | |
| | Y | 60 | | | | | 0.00 | 2.31 | 5.77 | 9.23 | 16.16 | 30.02 |
| | L1 | 60 | | | | | | | 16.30 | 19.77 | 26.70 | 40.55 |
| | L2 | 60 | | | | | | | 26.21 | 29.67 | 36.60 | 50.46 |
| | Z | 60 | | | | | | | 24.40 | 26.14 | 29.60 | 36.53 |
| MINIMUM H = 13.63 | | | | | | | | | | | | |
| | Y | 90 | | | | | | | | 2.62 | 8.62 | 20.62 |
| | L1 | 90 | | | | | | | | | 19.94 | 31.94 |
| | L2 | 90 | | | | | | | | | 34.80 | 46.80 |
| | Z | 90 | | | | | | | | | 23.74 | 23.74 |
| MINIMUM H = 23.74 | | | | | | | | | | | | |

## Additional Bending Tables (cont'd)

| | DIM | ANGLE | 2" | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 24" | 36" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1/2" IMC, Rigid, and 40 Mil PVC-Coated Rigid** | | | | | | | | | | | | |
| | Y | 15 | 3.03 | 10.76 | 18.48 | 26.21 | 33.94 | 41.67 | 53.26 | 64.85 | 88.03 | 134.39 |
| | L1 | 15 | 7.72 | 15.45 | 23.18 | 30.90 | 38.63 | 46.36 | 57.95 | 69.54 | 92.72 | 139.09 |
| | L2 | 15 | 8.87 | 16.59 | 24.32 | 32.05 | 39.78 | 47.50 | 59.10 | 70.69 | 93.87 | 140.23 |
| | Z | 15 | 11.12 | 18.58 | 26.05 | 33.51 | 40.97 | 48.44 | 59.63 | 70.83 | 93.22 | 138.01 |
| MINIMUM H = 0.95 | | | | | | | | | | | | |
| | Y | 22.5 | .77 | 5.98 | 11.21 | 16.44 | 21.66 | 26.89 | 34.73 | 42.57 | 58.25 | 89.60 |
| | L1 | 22.5 | 5.20 | 10.43 | 15.66 | 20.88 | 26.11 | 31.34 | 39.17 | 47.01 | 62.69 | 94.05 |
| | L2 | 22.5 | 6.92 | 12.15 | 17.38 | 22.60 | 27.83 | 33.06 | 40.89 | 48.73 | 64.41 | 95.77 |
| | Z | 22.5 | 9.07 | 13.90 | 18.73 | 23.56 | 28.38 | 33.21 | 40.46 | 47.70 | 62.18 | 91.15 |
| MINIMUM H = 1.62 | | | | | | | | | | | | |
| | Y | 30 | | 3.49 | 7.49 | 11.49 | 15.49 | 19.49 | 25.49 | 31.49 | 43.49 | 67.49 |
| | L1 | 30 | | 7.95 | 11.95 | 15.95 | 19.95 | 23.95 | 29.95 | 35.95 | 47.95 | 71.95 |
| | L2 | 30 | | 10.24 | 14.24 | 18.24 | 22.24 | 26.24 | 32.24 | 38.24 | 50.24 | 74.24 |
| | Z | 30 | | 11.78 | 15.24 | 18.70 | 22.17 | 25.63 | 30.83 | 36.02 | 46.42 | 67.20 |
| MINIMUM H = 2.42 | | | | | | | | | | | | |
| | Y | 45 | | | 3.59 | 6.41 | 9.23 | 12.06 | 16.30 | 20.55 | 29.03 | 46.00 |
| | L1 | 45 | | | 8.30 | 11.13 | 13.95 | 16.78 | 21.02 | 25.27 | 33.75 | 50.72 |
| | L2 | 45 | | | 11.74 | 14.57 | 17.39 | 20.22 | 24.46 | 28.71 | 37.19 | 54.16 |
| | Z | 45 | | | 12.13 | 14.13 | 16.13 | 18.13 | 21.13 | 24.13 | 30.13 | 42.13 |
| MINIMUM H = 4.33 | | | | | | | | | | | | |
| | Y | 60 | | | 1.42 | 3.73 | 6.04 | 8.34 | 11.81 | 15.27 | 22.20 | 36.06 |
| | L1 | 60 | | | | 8.77 | 11.08 | 13.39 | 16.85 | 20.31 | 27.24 | 41.10 |
| | L2 | 60 | | | | 13.35 | 15.66 | 17.97 | 21.44 | 24.90 | 31.83 | 45.69 |
| | Z | 60 | | | | 12.18 | 13.33 | 14.49 | 16.22 | 17.95 | 21.41 | 28.34 |
| MINIMUM H = 6.55 | | | | | | | | | | | | |
| | Y | 90 | | | | .71 | 2.71 | 4.71 | 7.71 | 10.71 | 16.70 | 28.70 |
| | L1 | 90 | | | | | | 10.12 | 13.12 | 16.12 | 22.12 | 34.12 |
| | L2 | 90 | | | | | | 17.00 | 20.00 | 23.00 | 29.00 | 41.00 |
| | Z | 90 | | | | | | 11.26 | 11.26 | 11.26 | 11.26 | 11.26 |
| MINIMUM H = 11.26 | | | | | | | | | | | | |
| **3/4" IMC, Rigid, and 40 Mil PVC-Coated Rigid** | | | | | | | | | | | | |
| | Y | 15 | 1.86 | 9.58 | 17.31 | 25.04 | 32.77 | 40.49 | 52.08 | 63.68 | 86.86 | 133.22 |
| | L1 | 15 | 7.72 | 15.45 | 23.17 | 30.90 | 38.63 | 46.36 | 57.95 | 69.54 | 92.72 | 139.08 |
| | L2 | 15 | 9.19 | 16.91 | 24.64 | 32.37 | 40.09 | 47.82 | 59.41 | 71.00 | 94.19 | 140.55 |
| | Z | 15 | 12.06 | 19.53 | 26.89 | 34.46 | 41.92 | 49.38 | 60.58 | 71.78 | 94.17 | 138.95 |
| MINIMUM H = 1.19 | | | | | | | | | | | | |
| | Y | 22.5 | | 4.85 | 10.08 | 15.31 | 20.53 | 25.76 | 33.60 | 41.44 | 57.12 | 88.47 |
| | L1 | 22.5 | | 10.42 | 15.65 | 20.88 | 26.10 | 31.33 | 39.17 | 47.01 | 62.69 | 94.04 |
| | L2 | 22.5 | | 12.62 | 17.85 | 23.08 | 28.30 | 33.53 | 41.37 | 49.21 | 64.89 | 96.24 |
| | Z | 22.5 | | 15.01 | 19.84 | 24.67 | 29.49 | 34.32 | 41.57 | 48.81 | 63.29 | 92.26 |
| MINIMUM H = 2.05 | | | | | | | | | | | | |
| | Y | 30 | | 2.33 | 6.33 | 10.33 | 14.33 | 18.33 | 24.33 | 30.33 | 42.33 | 66.33 |
| | L1 | 30 | | 7.93 | 11.93 | 15.93 | 19.93 | 23.93 | 29.93 | 35.93 | 47.93 | 71.93 |
| | L2 | 30 | | 10.86 | 14.86 | 18.86 | 22.86 | 26.86 | 32.86 | 38.86 | 50.86 | 74.86 |
| | Z | 30 | | 13.05 | 16.52 | 19.98 | 23.45 | 26.91 | 32.11 | 37.30 | 47.70 | 68.48 |
| MINIMUM H = 3.06 | | | | | | | | | | | | |
| | Y | 45 | | | 2.31 | 5.13 | 7.96 | 10.79 | 15.03 | 19.28 | 27.76 | 44.73 |
| | L1 | 45 | | | 8.24 | 11.07 | 13.90 | 16.73 | 20.97 | 25.21 | 33.70 | 50.67 |
| | L2 | 45 | | | 12.64 | 15.47 | 18.30 | 21.13 | 25.37 | 29.61 | 38.10 | 55.07 |
| | Z | 45 | | | 13.76 | 15.76 | 17.76 | 19.76 | 22.76 | 25.76 | 31.76 | 43.76 |
| MINIMUM H = 5.49 | | | | | | | | | | | | |
| | Y | 60 | | | | 2.28 | 4.59 | 6.90 | 10.36 | 13.83 | 20.75 | 34.61 |
| | L1 | 60 | | | | | 10.94 | 13.25 | 16.72 | 20.18 | 27.11 | 40.97 |
| | L2 | 60 | | | | | 16.81 | 19.12 | 22.58 | 26.05 | 32.98 | 46.83 |
| | Z | 60 | | | | | 15.36 | 16.52 | 18.25 | 19.88 | 23.45 | 30.38 |
| MINIMUM H = 8.31 | | | | | | | | | | | | |
| | Y | 90 | | | | | .76 | 2.76 | 5.76 | 8.76 | 14.76 | 26.76 |
| | L1 | 90 | | | | | | | 12.60 | 15.60 | 21.60 | 33.60 |
| | L2 | 90 | | | | | | | 21.39 | 24.39 | 30.39 | 42.39 |
| | Z | 90 | | | | | | | 14.33 | 14.33 | 14.33 | 14.33 |
| MINIMUM H = 14.33 | | | | | | | | | | | | |

## Additional Bending Tables (cont'd)

| | DIM | ANGLE | 2" | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 24" | 36" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1" IMC, Rigid, and 40 Mil PVC-Coated Rigid** | | | | | | | | | | | | |
| | Y | 15 | 1.08 | 8.81 | 16.52 | 24.25 | 31.97 | 39.70 | 51.29 | 62.88 | 86.07 | 132.43 |
| | L1 | 15 | 7.72 | 15.44 | 23.17 | 30.90 | 38.63 | 46.35 | 57.94 | 69.54 | 92.72 | 139.08 |
| | L2 | 15 | 9.59 | 17.32 | 25.04 | 32.77 | 40.50 | 48.23 | 59.82 | 71.41 | 94.59 | 140.95 |
| | Z | 15 | 12.53 | 20.00 | 27.46 | 34.93 | 42.39 | 49.86 | 61.05 | 72.25 | 94.64 | 139.43 |
| MINIMUM H = 1.31 | | | | | | | | | | | | |
| | Y | 22.5 | | 4.13 | 9.35 | 14.58 | 19.81 | 25.03 | 32.87 | 40.71 | 56.39 | 87.75 |
| | L1 | 22.5 | | 10.42 | 15.64 | 20.87 | 26.09 | 31.32 | 39.16 | 47.00 | 62.68 | 94.04 |
| | L2 | 22.5 | | 13.22 | 18.45 | 23.68 | 28.90 | 34.13 | 41.97 | 49.81 | 65.49 | 96.84 |
| | Z | 22.5 | | 15.69 | 20.52 | 25.35 | 30.18 | 35.01 | 42.25 | 49.49 | 63.98 | 92.95 |
| MINIMUM H = 2.31 | | | | | | | | | | | | |
| | Y | 30 | | 1.58 | 5.58 | 9.58 | 13.58 | 17.58 | 23.58 | 29.58 | 41.58 | 65.58 |
| | L1 | 30 | | 7.91 | 11.91 | 15.91 | 19.91 | 23.91 | 29.91 | 35.91 | 47.91 | 71.91 |
| | L2 | 30 | | 11.66 | 15.66 | 19.66 | 23.66 | 27.66 | 33.66 | 39.66 | 51.66 | 75.66 |
| | Z | 30 | | 13.95 | 17.41 | 20.88 | 24.34 | 27.81 | 33.00 | 38.20 | 48.59 | 69.38 |
| MINIMUM H = 3.51 | | | | | | | | | | | | |
| | Y | 45 | | | 1.42 | 4.24 | 7.06 | 9.89 | 14.14 | 18.38 | 26.86 | 43.83 |
| | L1 | 45 | | | | 11.01 | 13.83 | 16.66 | 20.91 | 25.15 | 33.63 | 50.60 |
| | L2 | 45 | | | | 16.62 | 19.45 | 22.28 | 26.52 | 30.76 | 39.25 | 56.22 |
| | Z | 45 | | | | 17.11 | 19.11 | 21.11 | 24.11 | 27.11 | 33.11 | 45.11 |
| MINIMUM H = 6.44 | | | | | | | | | | | | |
| | Y | 60 | | | | 1.17 | 3.48 | 5.79 | 9.25 | 12.71 | 19.64 | 33.49 |
| | L1 | 60 | | | | | 10.78 | 13.09 | 16.55 | 20.02 | 26.94 | 40.80 |
| | L2 | 60 | | | | | 18.27 | 20.58 | 24.04 | 27.50 | 34.43 | 48.29 |
| | Z | 60 | | | | | 17.22 | 18.37 | 20.11 | 21.84 | 25.30 | 32.23 |
| MINIMUM H = 9.91 | | | | | | | | | | | | |
| | Y | 90 | | | | | | 1.01 | 4.01 | 7.01 | 13.01 | 25.01 |
| | L1 | 90 | | | | | | | | 14.93 | 20.93 | 32.93 |
| | L2 | 90 | | | | | | | | 26.16 | 32.16 | 44.16 |
| | Z | 90 | | | | | | | | 17.49 | 17.49 | 17.49 |
| MINIMUM H = 17.49 | | | | | | | | | | | | |
| **1-1/4" IMC, Rigid, and 40 Mil PVC-Coated Rigid** | | | | | | | | | | | | |
| | Y | 15 | | 7.15 | 14.87 | 22.60 | 30.33 | 38.06 | 49.65 | 61.24 | 84.42 | 130.78 |
| | L1 | 15 | 7.71 | 15.44 | 23.17 | 30.90 | 38.62 | 46.35 | 57.94 | 69.53 | 92.72 | 139.08 |
| | L2 | 15 | 10.07 | 17.80 | 25.53 | 33.25 | 40.98 | 48.71 | 60.30 | 71.89 | 95.07 | 141.44 |
| | Z | 15 | 13.77 | 21.24 | 28.70 | 36.17 | 43.63 | 51.09 | 62.29 | 73.49 | 95.88 | 140.66 |
| MINIMUM H = 1.63 | | | | | | | | | | | | |
| | Y | 22.5 | | 2.57 | 7.80 | 13.02 | 18.25 | 23.47 | 31.31 | 39.15 | 54.83 | 86.19 |
| | L1 | 22.5 | | 10.41 | 15.63 | 20.86 | 26.09 | 31.31 | 39.15 | 46.99 | 62.67 | 94.03 |
| | L2 | 22.5 | | 13.94 | 19.17 | 24.40 | 29.62 | 34.85 | 42.69 | 50.53 | 66.21 | 97.56 |
| | Z | 22.5 | | 17.18 | 22.01 | 26.84 | 31.66 | 36.49 | 43.73 | 50.98 | 65.46 | 94.43 |
| MINIMUM H = 2.88 | | | | | | | | | | | | |
| | Y | 30 | | | 4.00 | 8.00 | 12.00 | 16.00 | 22.00 | 28.00 | 40.00 | 64.00 |
| | L1 | 30 | | | 11.89 | 15.89 | 19.89 | 23.89 | 29.89 | 35.89 | 47.89 | 71.89 |
| | L2 | 30 | | | 16.61 | 20.61 | 24.61 | 28.61 | 34.61 | 40.61 | 52.61 | 76.61 |
| | Z | 30 | | | 19.16 | 22.62 | 26.09 | 29.55 | 34.75 | 39.94 | 50.33 | 71.12 |
| MINIMUM H = 4.38 | | | | | | | | | | | | |
| | Y | 45 | | | | 2.48 | 5.31 | 8.14 | 12.38 | 16.62 | 25.11 | 42.08 |
| | L1 | 45 | | | | | 13.75 | 16.58 | 20.83 | 25.07 | 33.55 | 50.52 |
| | L2 | 45 | | | | | 20.83 | 23.66 | 27.90 | 32.14 | 40.63 | 57.60 |
| | Z | 45 | | | | | 21.40 | 23.40 | 26.40 | 29.40 | 35.40 | 47.40 |
| MINIMUM H = 8.06 | | | | | | | | | | | | |
| | Y | 60 | | | | | 1.46 | 3.77 | 7.23 | 10.69 | 17.62 | 31.48 |
| | L1 | 60 | | | | | | | 16.35 | 19.82 | 26.74 | 40.60 |
| | L2 | 60 | | | | | | | 25.79 | 29.25 | 36.18 | 50.04 |
| | Z | 60 | | | | | | | 23.00 | 24.73 | 28.20 | 35.13 |
| MINIMUM H = 11.32 | | | | | | | | | | | | |
| | Y | 90 | | | | | | | 1.23 | 4.23 | 10.23 | 22.23 |
| | L1 | 90 | | | | | | | | | 20.13 | 32.13 |
| | L2 | 90 | | | | | | | | | 34.29 | 46.29 |
| | Z | 90 | | | | | | | | | 21.96 | 21.96 |
| MINIMUM H = 21.96 | | | | | | | | | | | | |

## Additional Bending Tables (cont'd)

| | DIM | ANGLE | 2" | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 24" | 36" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1-1/2" Rigid and 40 Mil PVC-Coated Rigid** | | | | | | | | | | | | |
| | Y | 15 | | 5.87 | 13.59 | 21.32 | 29.05 | 36.77 | 48.37 | 59.96 | 83.14 | 129.50 |
| | L1 | 15 | 7.71 | 15.44 | 23.17 | 20.90 | 38.62 | 46.35 | 57.94 | 69.53 | 92.72 | 139.08 |
| | L2 | 15 | 9.94 | 17.67 | 25.39 | 33.12 | 40.85 | 48.58 | 60.17 | 71.76 | 94.94 | 141.31 |
| | Z | 15 | 14.50 | 21.97 | 29.43 | 36.89 | 44.36 | 51.82 | 63.02 | 74.21 | 96.61 | 141.39 |
| MINIMUM H = 1.82 | | | | | | | | | | | | |
| | Y | 22.5 | | 1.48 | 6.71 | 11.93 | 17.16 | 22.38 | 30.22 | 38.06 | 53.74 | 85.10 |
| | L1 | 22.5 | | 10.41 | 15.64 | 20.86 | 26.09 | 31.31 | 39.15 | 46.99 | 62.67 | 94.03 |
| | L2 | 22.5 | | 13.75 | 18.97 | 24.20 | 29.43 | 34.65 | 42.49 | 50.33 | 66.01 | 97.37 |
| | Z | 22.5 | | 17.84 | 22.67 | 27.50 | 32.32 | 37.15 | 44.39 | 51.64 | 66.12 | 95.09 |
| MINIMUM H = 3.13 | | | | | | | | | | | | |
| | Y | 30 | | | 3.02 | 7.02 | 11.02 | 15.02 | 21.02 | 27.02 | 39.02 | 63.02 |
| | L1 | 30 | | | 11.90 | 15.90 | 19.90 | 23.90 | 29.90 | 35.90 | 47.90 | 71.90 |
| | L2 | 30 | | | 16.35 | 20.35 | 24.35 | 28.35 | 34.35 | 40.35 | 52.35 | 76.35 |
| | Z | 30 | | | 19.75 | 23.21 | 26.68 | 30.14 | 35.34 | 40.53 | 50.92 | 71.71 |
| MINIMUM H = 4.68 | | | | | | | | | | | | |
| | Y | 45 | | | | 1.65 | 4.48 | 7.31 | 11.55 | 15.79 | 24.28 | 41.25 |
| | L1 | 45 | | | | | 13.78 | 16.60 | 20.85 | 25.09 | 33.58 | 50.55 |
| | L2 | 45 | | | | | 20.45 | 23.28 | 27.52 | 31.77 | 40.25 | 57.22 |
| | Z | 45 | | | | | 21.84 | 23.84 | 26.84 | 29.84 | 35.84 | 47.84 |
| MINIMUM H = 8.37 | | | | | | | | | | | | |
| | Y | 60 | | | | | 0.74 | 3.05 | 6.52 | 9.98 | 16.91 | 30.76 |
| | L1 | 60 | | | | | | | 16.41 | 19.87 | 26.80 | 40.66 |
| | L2 | 60 | | | | | | | 25.31 | 28.77 | 35.70 | 49.56 |
| | Z | 60 | | | | | | | 23.28 | 25.01 | 28.47 | 35.40 |
| MINIMUM H = 12.66 | | | | | | | | | | | | |
| | Y | 90 | | | | | | | 0.75 | 3.75 | 9.75 | 21.75 |
| | L1 | 90 | | | | | | | | | 20.35 | 32.35 |
| | L2 | 90 | | | | | | | | | 33.70 | 45.70 |
| | Z | 90 | | | | | | | | | 21.80 | 21.80 |
| MINIMUM H = 21.80 | | | | | | | | | | | | |
| **2" Rigid and 40 Mil PVC-Coated Rigid** | | | | | | | | | | | | |
| | Y | 15 | | 4.42 | 12.15 | 19.87 | 27.60 | 35.33 | 46.92 | 58.51 | 81.69 | 128.06 |
| | L1 | 15 | 7.71 | 15.44 | 23.17 | 30.89 | 38.62 | 46.35 | 57.94 | 69.53 | 92.71 | 139.08 |
| | L2 | 15 | 10.27 | 18.00 | 25.73 | 33.46 | 41.18 | 48.91 | 60.50 | 72.09 | 95.27 | 141.64 |
| | Z | 15 | 15.20 | 22.66 | 30.13 | 37.59 | 45.06 | 52.52 | 63.72 | 74.91 | 97.30 | 142.09 |
| MINIMUM H = 2.00 | | | | | | | | | | | | |
| | Y | 22.5 | | 0.24 | 5.47 | 10.70 | 15.92 | 21.15 | 28.99 | 36.83 | 52.51 | 83.86 |
| | L1 | 22.5 | | 10.40 | 15.63 | 20.85 | 26.08 | 31.31 | 39.15 | 46.99 | 62.66 | 94.02 |
| | L2 | 22.5 | | 14.24 | 19.47 | 24.70 | 29.92 | 35.15 | 42.99 | 50.83 | 66.51 | 97.86 |
| | Z | 22.5 | | 18.71 | 23.54 | 28.36 | 33.19 | 38.02 | 45.26 | 52.51 | 66.99 | 95.96 |
| MINIMUM H = 3.47 | | | | | | | | | | | | |
| | Y | 30 | | | 1.84 | 5.84 | 9.84 | 13.84 | 19.84 | 25.84 | 37.84 | 61.84 |
| | L1 | 30 | | | 11.88 | 15.88 | 19.88 | 23.88 | 29.88 | 35.88 | 47.88 | 71.88 |
| | L2 | 30 | | | 17.00 | 21.00 | 25.00 | 29.00 | 35.00 | 41.00 | 53.00 | 77.00 |
| | Z | 30 | | | 20.79 | 24.26 | 27.72 | 31.19 | 36.38 | 41.58 | 51.97 | 71.75 |
| MINIMUM H = 5.20 | | | | | | | | | | | | |
| | Y | 45 | | | | 0.42 | 3.25 | 6.08 | 10.32 | 14.57 | 23.05 | 40.02 |
| | L1 | 45 | | | | | 13.72 | 16.55 | 20.79 | 25.04 | 33.52 | 50.49 |
| | L2 | 45 | | | | | 21.40 | 24.23 | 28.47 | 32.72 | 41.20 | 58.17 |
| | Z | 45 | | | | | 23.26 | 25.26 | 28.26 | 31.26 | 37.26 | 49.26 |
| MINIMUM H = 9.38 | | | | | | | | | | | | |
| | Y | 60 | | | | | | 1.68 | 5.14 | 8.61 | 15.54 | 29.39 |
| | L1 | 60 | | | | | | | 16.27 | 19.73 | 26.66 | 40.52 |
| | L2 | 60 | | | | | | | 26.51 | 29.97 | 36.90 | 50.76 |
| | Z | 60 | | | | | | | 25.11 | 26.85 | 30.31 | 37.24 |
| MINIMUM H = 14.25 | | | | | | | | | | | | |
| | Y | 90 | | | | | | | | 1.87 | 7.87 | 19.87 |
| | L1 | 90 | | | | | | | | | | 31.80 |
| | L2 | 90 | | | | | | | | | | 47.16 |
| | Z | 90 | | | | | | | | | | 24.72 |
| MINIMUM H = 24.72 | | | | | | | | | | | | |

## Additional Bending Tables (cont'd)

| | DIM | ANGLE | 2" | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 24" | 36" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1-1/2" IMC** | | | | | | | | | | | | |
| | Y | 15 | | 6.41 | 14.14 | 21.87 | 29.60 | 37.32 | 48.91 | 60.51 | 83.69 | 130.05 |
| | L1 | 15 | 7.71 | 15.44 | 23.17 | 30.90 | 38.62 | 46.35 | 57.94 | 69.53 | 92.72 | 139.00 |
| | L2 | 15 | 9.95 | 17.68 | 25.40 | 33.13 | 40.86 | 48.58 | 60.18 | 71.77 | 94.94 | 141.31 |
| | Z | 15 | 13.99 | 21.45 | 28.92 | 36.38 | 43.85 | 51.31 | 62.51 | 73.70 | 96.10 | 140.88 |
| MINIMUM H = 1.69 | | | | | | | | | | | | |
| | Y | 22.5 | | 2.02 | 7.24 | 12.47 | 17.69 | 22.92 | 30.76 | 38.60 | 54.28 | 85.64 |
| | L1 | 22.5 | | 10.41 | 15.64 | 20.86 | 26.09 | 31.31 | 39.15 | 46.99 | 62.67 | 94.03 |
| | L2 | 22.5 | | 13.76 | 18.98 | 24.21 | 29.44 | 34.66 | 42.50 | 50.34 | 66.02 | 97.38 |
| | Z | 22.5 | | 17.33 | 22.16 | 26.99 | 31.82 | 36.64 | 43.89 | 51.13 | 65.61 | 94.59 |
| MINIMUM H = 2.94 | | | | | | | | | | | | |
| | Y | 30 | | | 3.55 | 7.55 | 11.55 | 15.55 | 21.55 | 27.55 | 39.55 | 63.55 |
| | L1 | 30 | | | 11.90 | 15.90 | 19.90 | 23.90 | 29.90 | 35.90 | 47.90 | 71.90 |
| | L2 | 30 | | | 16.36 | 20.36 | 24.36 | 28.36 | 34.36 | 40.36 | 52.36 | 76.36 |
| | Z | 30 | | | 19.24 | 22.71 | 26.17 | 29.64 | 34.83 | 40.03 | 50.42 | 71.21 |
| MINIMUM H = 4.43 | | | | | | | | | | | | |
| | Y | 45 | | | | 2.17 | 5.00 | 7.83 | 12.07 | 16.31 | 24.80 | 41.77 |
| | L1 | 45 | | | | | 13.78 | 16.60 | 20.85 | 25.09 | 33.57 | 50.54 |
| | L2 | 45 | | | | | 20.47 | 23.30 | 27.55 | 31.79 | 40.27 | 57.24 |
| | Z | 45 | | | | | 21.35 | 23.35 | 26.35 | 29.35 | 35.35 | 47.35 |
| MINIMUM H = 8.02 | | | | | | | | | | | | |
| | Y | 60 | | | | | 1.26 | 3.56 | 7.03 | 10.49 | 17.42 | 31.28 |
| | L1 | 60 | | | | | | | 16.40 | 19.87 | 26.80 | 40.65 |
| | L2 | 60 | | | | | | | 25.34 | 28.80 | 35.73 | 49.58 |
| | Z | 60 | | | | | | | 22.79 | 24.52 | 27.99 | 34.91 |
| MINIMUM H = 12.24 | | | | | | | | | | | | |
| | Y | 90 | | | | | | | 1.25 | 4.25 | 10.25 | 22.25 |
| | L1 | 90 | | | | | | | | | 20.34 | 32.34 |
| | L2 | 90 | | | | | | | | | 33.74 | 45.74 |
| | Z | 90 | | | | | | | | | 21.34 | 21.34 |
| MINIMUM H = 21.34 | | | | | | | | | | | | |
| **2" IMC** | | | | | | | | | | | | |
| | Y | 15 | | 5.04 | 12.77 | 20.50 | 28.22 | 35.95 | 47.54 | 59.13 | 82.31 | 128.68 |
| | L1 | 15 | 7.71 | 15.44 | 23.17 | 30.90 | 38.62 | 46.35 | 57.94 | 69.53 | 92.71 | 139.00 |
| | L2 | 15 | 10.19 | 17.92 | 25.64 | 33.37 | 41.10 | 48.83 | 60.42 | 72.01 | 95.19 | 141.56 |
| | Z | 15 | 14.56 | 22.03 | 29.49 | 36.96 | 44.42 | 51.89 | 63.00 | 74.28 | 96.67 | 141.45 |
| MINIMUM H = 1.84 | | | | | | | | | | | | |
| | Y | 22.5 | | 0.88 | 6.10 | 11.33 | 16.56 | 21.78 | 29.62 | 37.46 | 53.14 | 84.50 |
| | L1 | 22.5 | | 10.40 | 15.63 | 20.86 | 26.08 | 31.31 | 39.15 | 46.99 | 62.67 | 94.02 |
| | L2 | 22.5 | | 14.12 | 19.35 | 24.57 | 29.80 | 35.02 | 42.86 | 50.70 | 66.38 | 97.74 |
| | Z | 22.5 | | 18.03 | 22.86 | 27.69 | 32.52 | 37.34 | 44.59 | 51.83 | 66.31 | 95.29 |
| MINIMUM H = 3.20 | | | | | | | | | | | | |
| | Y | 30 | | | 2.50 | 6.50 | 10.50 | 14.50 | 20.50 | 26.50 | 38.50 | 62.50 |
| | L1 | 30 | | | 11.88 | 15.88 | 19.88 | 23.88 | 29.88 | 35.88 | 47.88 | 71.88 |
| | L2 | 30 | | | 16.84 | 20.84 | 24.84 | 28.84 | 34.84 | 40.84 | 52.84 | 76.84 |
| | Z | 30 | | | 20.07 | 23.54 | 27.00 | 30.46 | 35.66 | 40.86 | 51.25 | 72.03 |
| MINIMUM H = 4.84 | | | | | | | | | | | | |
| | Y | 45 | | | | 1.12 | 3.94 | 6.77 | 11.02 | 15.26 | 23.74 | 40.71 |
| | L1 | 45 | | | | | 13.74 | 16.56 | 20.81 | 25.05 | 33.53 | 50.50 |
| | L2 | 45 | | | | | 21.16 | 23.99 | 28.24 | 32.48 | 40.96 | 57.93 |
| | Z | 45 | | | | | 22.45 | 24.45 | 27.45 | 30.45 | 36.45 | 48.45 |
| MINIMUM H = 8.80 | | | | | | | | | | | | |
| | Y | 60 | | | | | 0.11 | 2.42 | 5.89 | 9.35 | 16.28 | 20.13 |
| | L1 | 60 | | | | | | | 16.30 | 19.77 | 26.70 | 20.55 |
| | L2 | 60 | | | | | | | 26.21 | 29.67 | 36.60 | 50.46 |
| | Z | 60 | | | | | | | 24.19 | 25.93 | 29.39 | 26.32 |
| MINIMUM H = 13.45 | | | | | | | | | | | | |
| | Y | 90 | | | | | | | | 2.75 | 8.75 | 20.75 |
| | L1 | 90 | | | | | | | | | 19.94 | 31.94 |
| | L2 | 90 | | | | | | | | | 34.80 | 46.80 |
| | Z | 90 | | | | | | | | | 23.53 | 23.53 |
| MINIMUM H = 23.53 | | | | | | | | | | | | |

## Handle Removal and Replacement (Serial Number AAJ7300 and above)

The handle of the 555 is designed to be removable. This feature is convenient when performing complex bending, and makes it easy to replace a damaged handle.

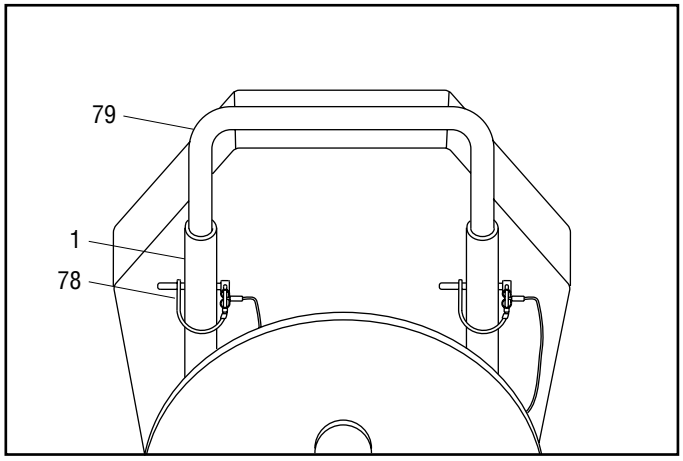
### Removal

1. Place the bender in the upright position.
2. Release the spring clip on the safety snap pin (78).
3. Remove the pin from the handle (79) and the sleeve of the frame (1).
4. Repeat Steps 1 through 3 for the other end of the handle.
5. Lift the handle to remove.

### Replacement

1. Insert the handle (79) into the sleeves of the frame (1).
2. Align the holes in the handle with the holes in the sleeves.
3. Insert the safety snap pin (78). Ensure that the pin goes through the handle and the sleeve on the frame (1).
4. Engage the safety spring clip over the end of the pin. Ensure that the loop on the clip is completely around the pin.
5. Repeat Steps 2 through 4 for the other end of the handle.

**Removing or Replacing Handle**




## Transportation

**⚠WARNING**

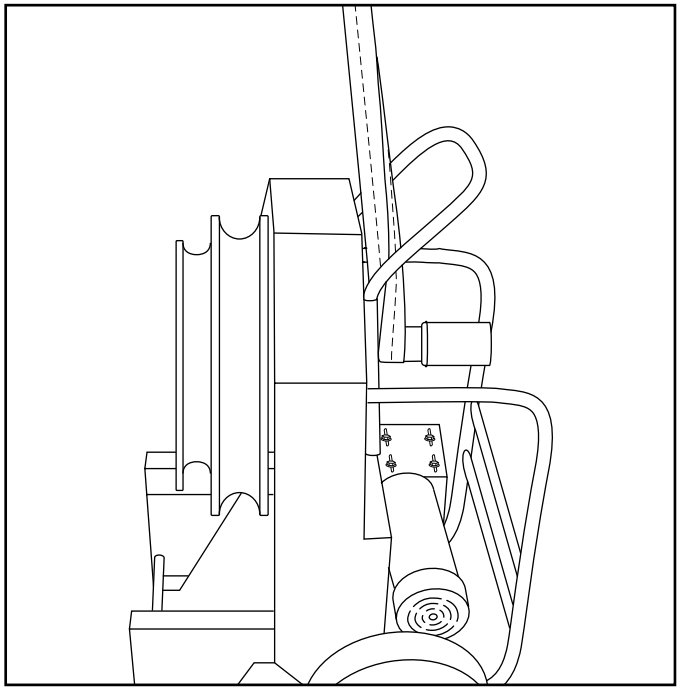
Make sure that the handle is properly installed and secured with the safety spring clips and snap pins before lifting or moving the bender. An improperly installed handle could allow the bender to fall, injuring nearby personnel.

Failure to observe this warning can result in severe injury or death.

The only proper way to lift this bender is by attaching a nylon or polyester sling around the storage spindle. The sling should extend between the handle and main frame of the bender so that the handle acts as a guide for the sling, as shown.

Make sure that all components used to lift this bender are properly rated for the 167 kg (368 lb) weight. Use a ramp to load and unload from a truck or other vehicle that is not equipped with a lift gate.

**Transporting Bender**



## Maintenance

There is no need for periodic flushing and replacing of lube in the bender gear box since it is sealed and locked tight. However, if the box is opened for repair and the lube is lost or contaminated by dirt, then the box and parts should be flushed out and filled with 26 fluid ounces of Mobil® 634 synthetic oil.

Flushing should be accomplished with kerosene, which is a petroleum hydrocarbon that does not affect seals.

*Note: Aromatic hydrocarbons such as benzine, chlorinated solvents such as carbon-tetrachloride, and ketones such as acetone should never be used for flushing as they are solvents for rubber. They are also harmful to the environment.*



**⚠WARNING**

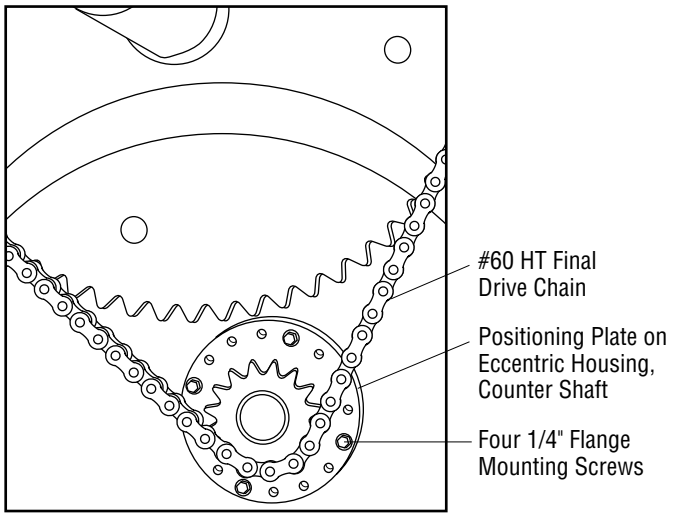
Disconnect this tool when not in use, before servicing or adjusting, and when changing shoes or conduit rollers and supports.

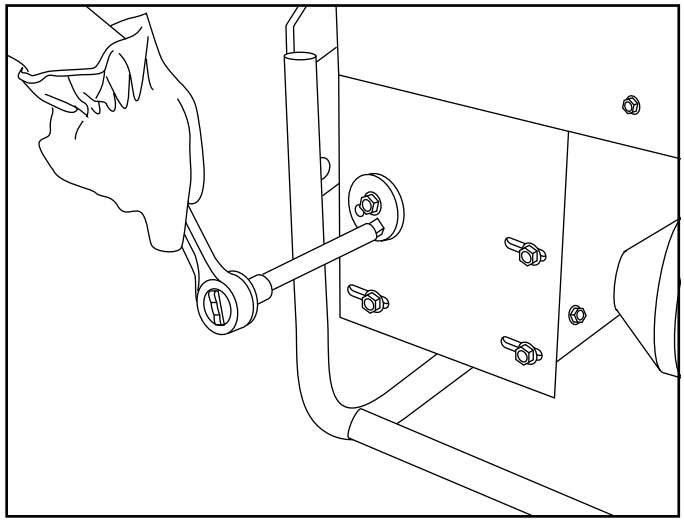
Failure to observe this warning can result in severe injury or death.

### Chain Adjustment

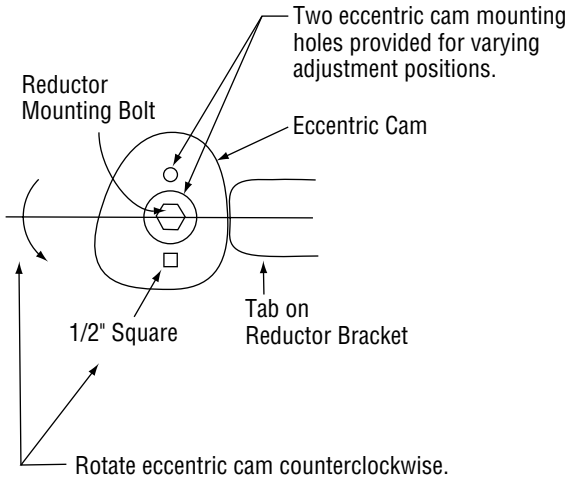
Both chains have to be adjusted if the final drive #60 chain is to be reset. Refer to the Exploded View and Parts List.

1. Remove the front cover (38) and upper rear guard (37).
2. Loosen the eight mounting bolts for the reductor (19). Remove the eccentric cam and move the reductor to create chain slack.
3. Remove the four retaining screws for eccentric adjustment. Rotate to remove slack from the chain and align with one of the two sets of holes in the frame. Remount the eccentric with the four bolts.
4. Slide the reductor in slotted mounting holes to the retension chain. Set tension with the eccentric cam.



With the eight reductor mounting bolts (22, 24) loose, rotate the eccentric cam with a 1/2" square drive to tension the chain. Torque the eight reductor mounting bolts to 47 Newton-meters (35 foot-pounds).



## Maintenance (cont'd)

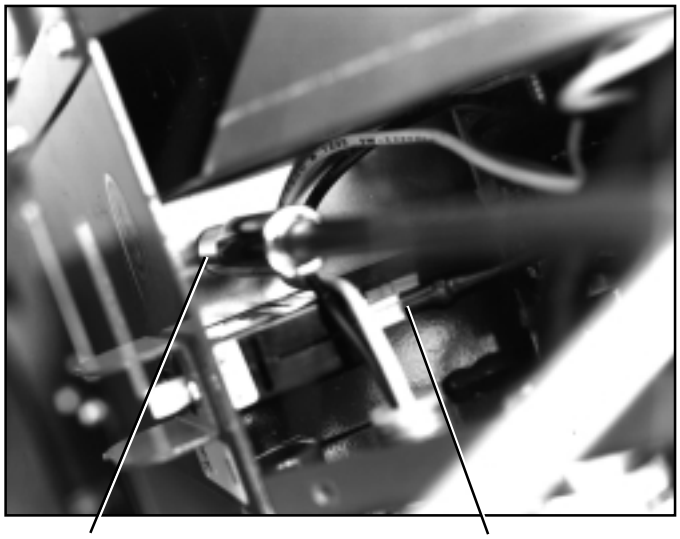
### Electrical Control Unit Removal

**⚠WARNING**

Disconnect power supply before servicing bender. Servicing to be done only by trained service technician.

Failure to observe this warning can result in severe injury or death.

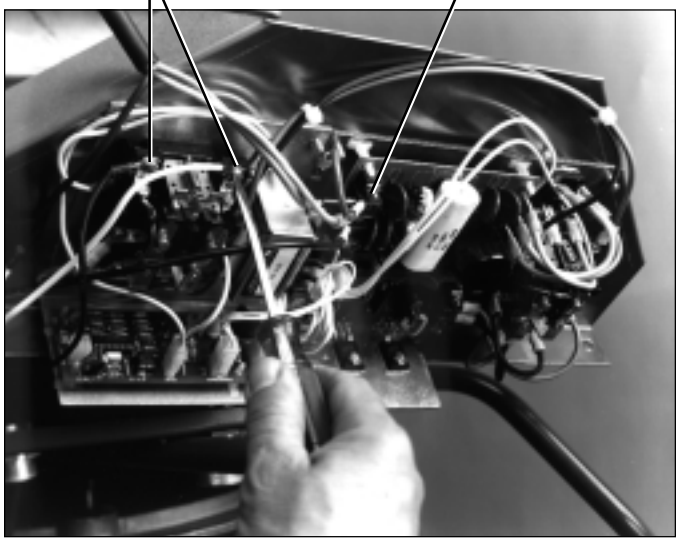
1. Remove the cover retained by ten 5/16 hex screws.
2. Disconnect the pendant switch plug from the circuit board and remove through the cord grip.
3. Remove two hex mounting screws, one on each side.



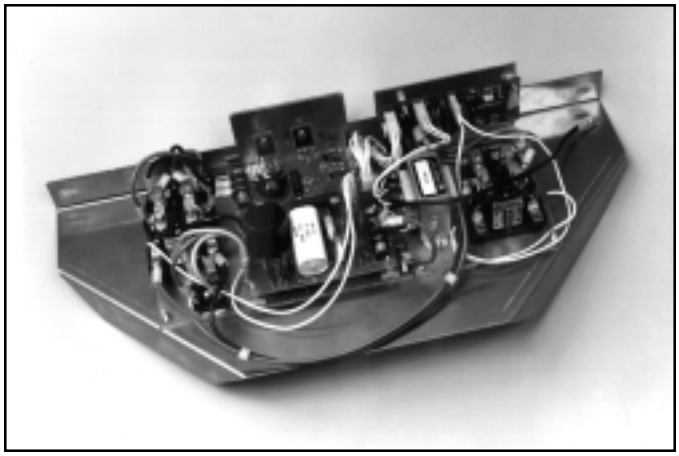
3/8" Hex Mounting Screw

Line Connection at Circuit Breaker

4. Remove the motor leads, power cord ground wire, and neutral wire before the control unit can be totally removed from the bender.




Electrical control removed from bender.



## Troubleshooting

| PROBLEM | PROBABLE CAUSE | POSSIBLE REMEDY |
|---|---|---|
| Bender will not operate. | No voltage. | Check supply voltage circuit operation. |
| | | Check that switch is on. |
| Bends are overbent a few degrees. | Too much squeeze on 1-1/2" or 2" EMT or IMC conduit. | Back squeeze off per adjustment instructions. |
| | Unusual conduit characteristics. | Bend smaller angle to compensate. |
| Bends are underbent a few degrees. | Too little squeeze on 1-1/2" or 2" EMT or IMC conduit. | Increase squeeze per adjustment instructions. |
| | Unusual conduit characteristics. | Bend larger angle to compensate. |

## Troubleshooting (cont'd)

The following flow charts show the suggested troubleshooting procedures for some bender problems. They by no means encompass all possible problems or solutions.



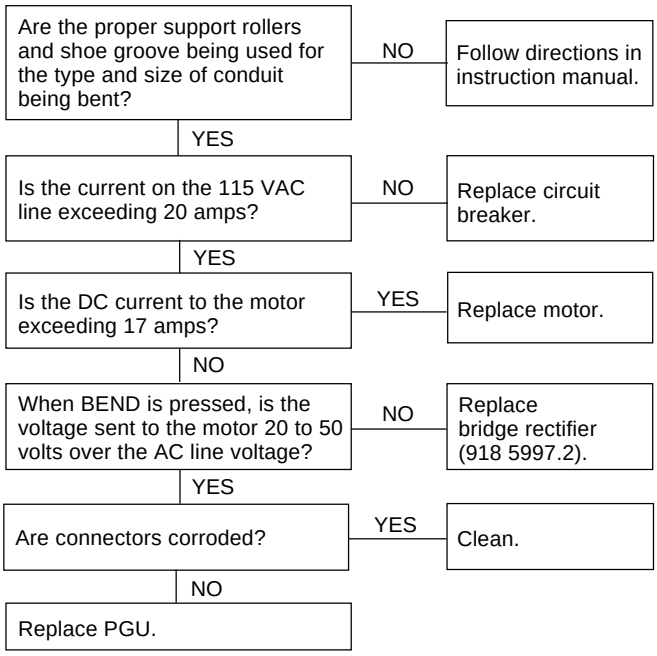
**⚠WARNING**

Electric shock hazard:

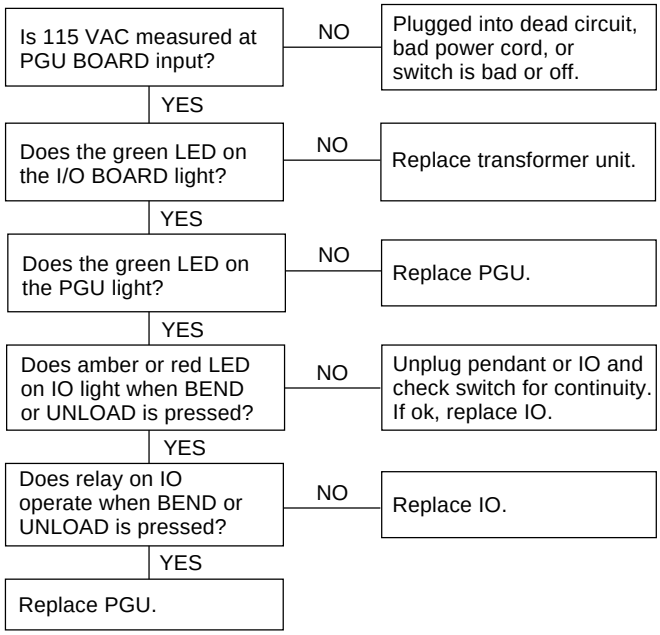
- Contact with live circuits can result in severe injury or death.
- Some troubleshooting steps require power to the bender. This type of troubleshooting step should only be performed at authorized Greenlee service centers by personnel who are familiar with safe troubleshooting procedures.

Failure to observe these warnings can result in severe injury or death.

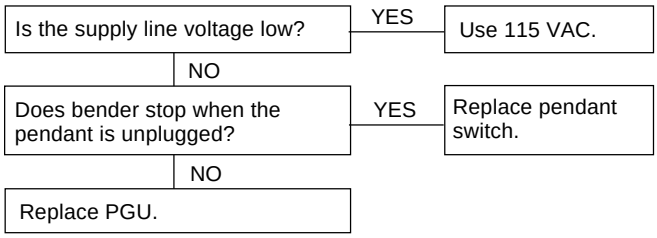
### Trips circuit breaker



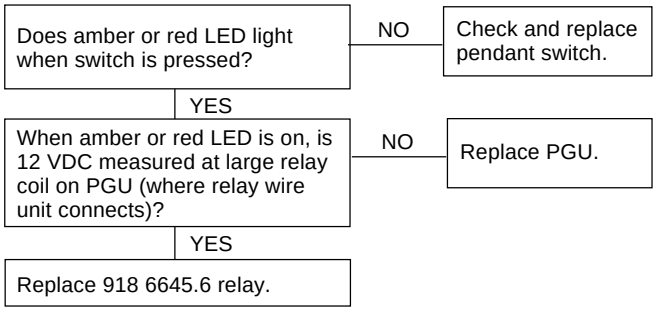

### Won't bend



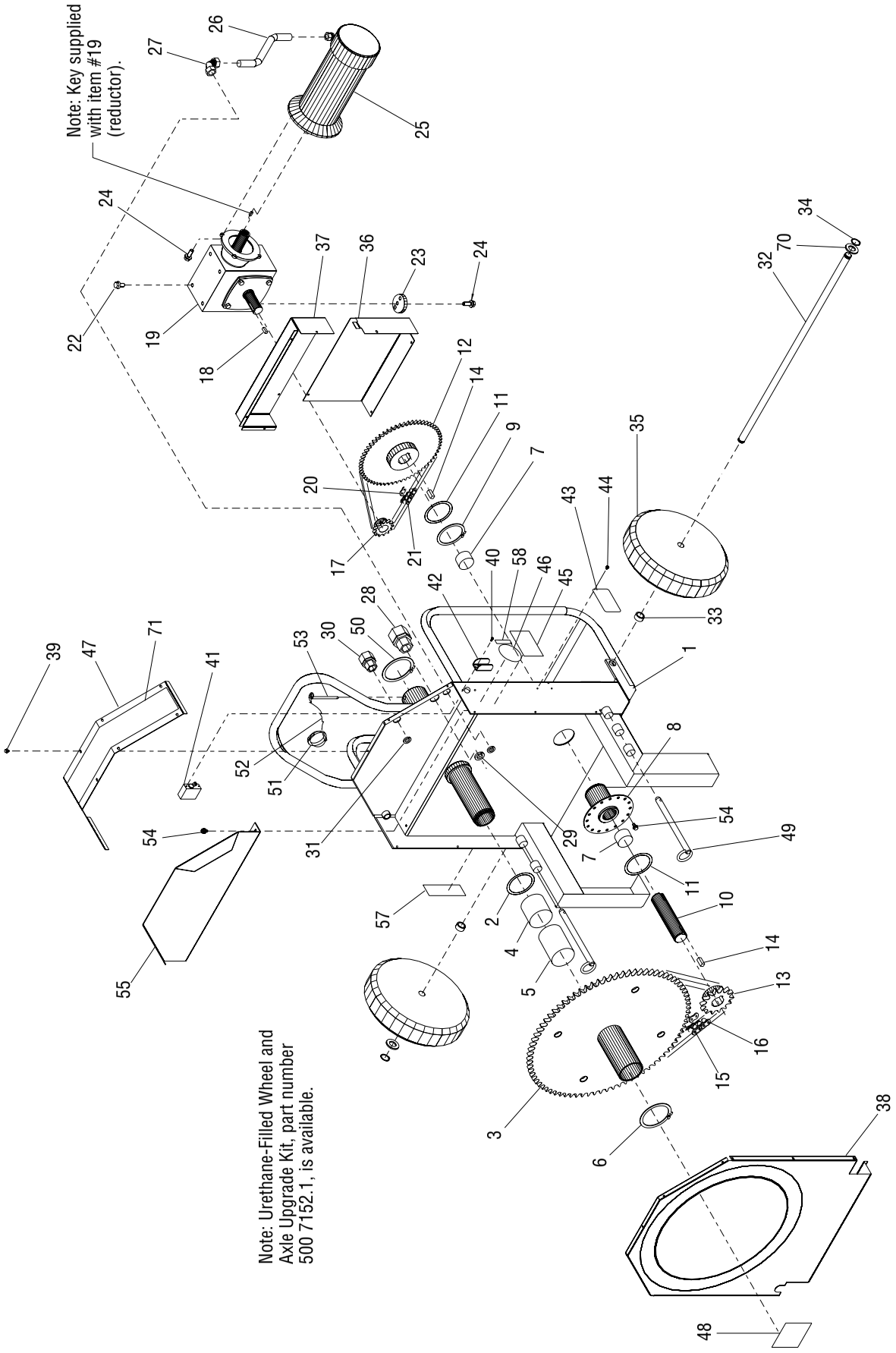

### Won't stop




### Bender only runs in one direction



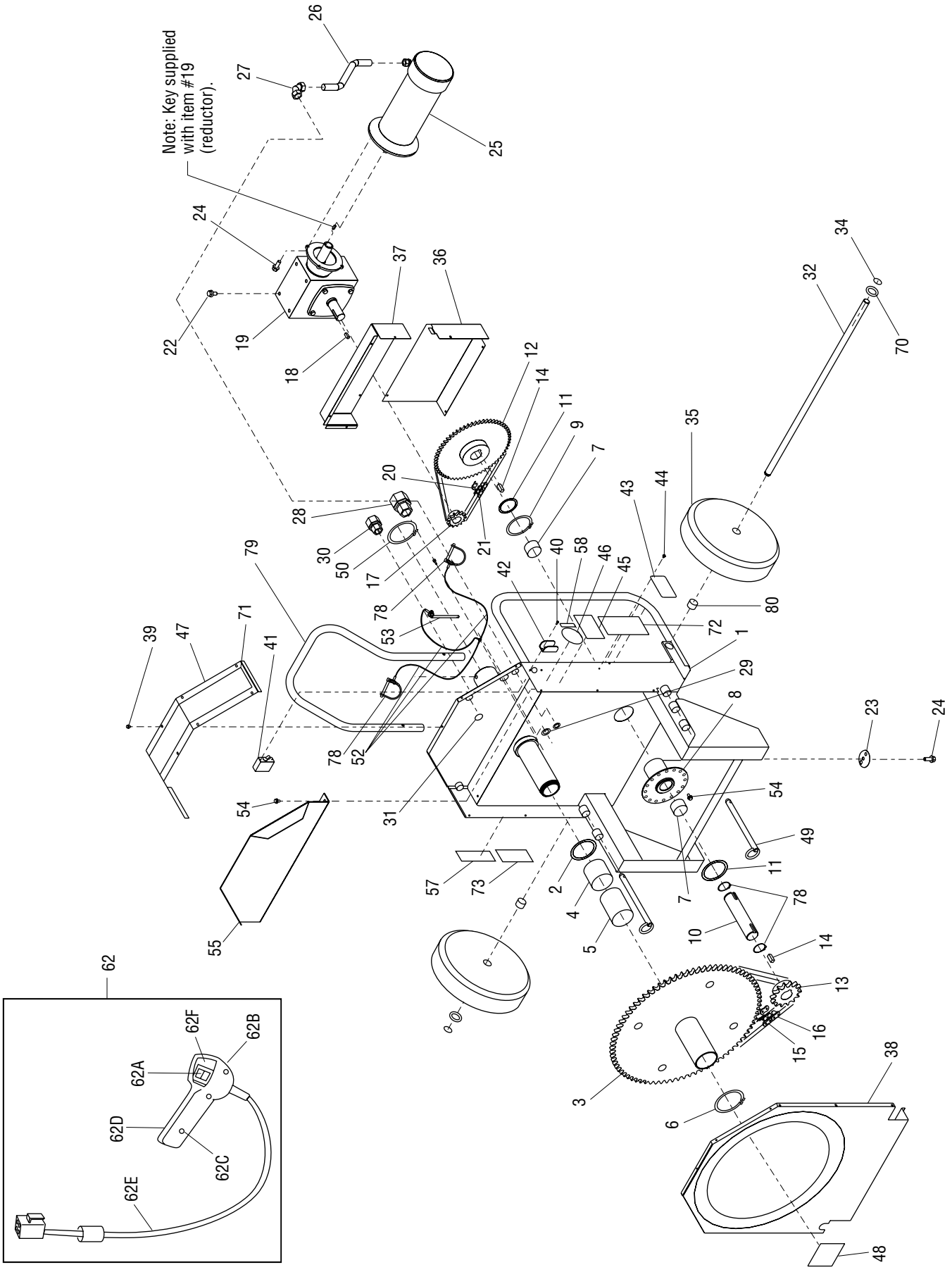
## Exploded View — 555® Electric Bender



## Parts List — 555® Electric Bender

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 503 9742.7 | Weldment, Main Frame | 1 |
| 2 | 502 3452.8 | Washer, Fiber | 1 |
| 3 | 503 2896.4 | Weldment, Sprocket Unit | 1 |
| 4 | 905 2409.8 | Bearing, Fiberglide ø2.625 x 2.5 long | 1 |
| 5 | 905 2410.1 | Bearing, Fiberglide ø2.625 x 3.75 long | 1 |
| 6 | 905 2414.4 | Ring, Retaining #5100-237 | 1 |
| 7 | 905 2412.8 | Bearing, Fiberglide ø1.625 x 1.00 long | 2 |
| 8 | 503 9763.0 | Weldment, Countershaft | 1 |
| 9 | 905 4023.9 | Ring, Retaining #5100-250 | 1 |
| 10 | 503 9764.8 | Shaft, Counter | 1 |
| 11 | 905 2413.6 | Bearing, Thrust Fiberglide | 2 |
| 12 | 905 4548.6 | Sprocket, #40 60T | 1 |
| 13 | 905 4253.3 | Sprocket, #60 14T | 1 |
| 14 | 503 9765.6 | Key, Countershaft | 2 |
| 15 | 905 4546.0 | Chain, #60 87P | 1 |
| 16 | 905 4251.7 | Masterlink, #60 | 1 |
| 17 | 905 4547.8 | Sprocket, #40 13T | 1 |
| 18 | 503 9825.3 | Key, Reductor Sprocket | 1 |
| 19 | 905 2388.1 | Reductor, Worm Gear | 1 |
| 20 | 905 2787.9 | Masterlink, #40 | 1 |
| 21 | 905 4551.6 | Chain, #40 87P | 1 |
| 22 | 905 4568.0 | Bolt, 3/8–16 UNC x .75 | 7 |
| 23 | 503 9758.3 | Eccentric | 1 |
| 24 | 905 4237.1 | Bolt, 3/8–16 UNC x 1.00 | 5 |
| 25 | 918 6417.8 | Motor | 1 |
| 26 | 905 4549.4 | Conduit, Sealtight | 1 |
| 27 | 918 5214.5 | Elbow, Sealtight | 1 |
| 28 | 918 6683.9 | Strain Relief | 1 |
| 29 | 905 1170.0 | Nut, 3/4 Conduit Lock | 1 |
| 30 | 918 6767.3 | Strain Relief, Pendant Switch | 1 |
| 31 | 918 6263.9 | Nut, 1/2 Conduit Lock | 1 |
| 32 | 503 9757.5 | Axle | 1 |
| 33 | 503 9767.2 | Bushing, Spacer | 2 |
| 34 | 905 1528.5 | Ring, Retaining #5160-75 | 2 |
| 35 | 905 3390.9 | Wheel | 2 |
| 36 | 503 9768.0 | Guard, Rear Lower | 1 |
| 37 | 503 9769.9 | Guard, Rear Upper | 1 |
| 38 | 503 9760.5 | Cover, Front | 1 |
| 39 | 905 1655.9 | Screw, #10–16 x .50 Hex Head | 30 |
| 40 | 905 0430.5 | Screw, #6–32 x .375 Phillips | 2 |
| 41 | 918 6385.6 | Switch, Air Pax | 1 |
| 42 | 502 9708.2 | Guard, Switch | 1 |
| 43 | 502 5928.8 | Nameplate | 1 |
| 44 | 905 3001.2 | Rivet, pop 1/8 x 1/8 Drive | 4 |
| 45 | 501 9053.9 | Decal, Voltage | 1 |
| 46 | 503 0392.9 | Decal, Damp Warning | 1 |
| 47 | 503 9759.1 | Cover, Top | 1 |
| 48 | 503 5191.5 | Decal, Safety | 1 |
| 49 | 905 3389.5 | Pin, Hitch | 2 |
| 50 | 905 2501.9 | Ring, Retaining #5100-287 | 1 |
| 51 | 905 4279.7 | Tie, Wrap | 4 |
| 52 | 905 4552.4 | Lanyard | 1 |
| 53 | 905 4545.1 | Pin, Hitch | 1 |
| 54 | 905 4335.1 | Screw, 1/4 x .37 Thread Forming | 6 |
| 55 | 503 9822.9 | Bracket, Mounting, Electrical | 1 |
| 57 | 503 3937.0 | Decal, Squeeze Adjust | 1 |
| 58 | 503 8974.2 | Decal, Circuit Breaker | 1 |
| 68 | 905 4335.1 | 1/4–14 Hex, Screw | 8 |
| 70 | 905 1740.7 | Washer, Flat | 2 |
| 71 | 500 2497.3 | Decal, Instruction | 1 |

## Exploded View — 555® Electric Bender (Serial Number AAJ7300 and above)



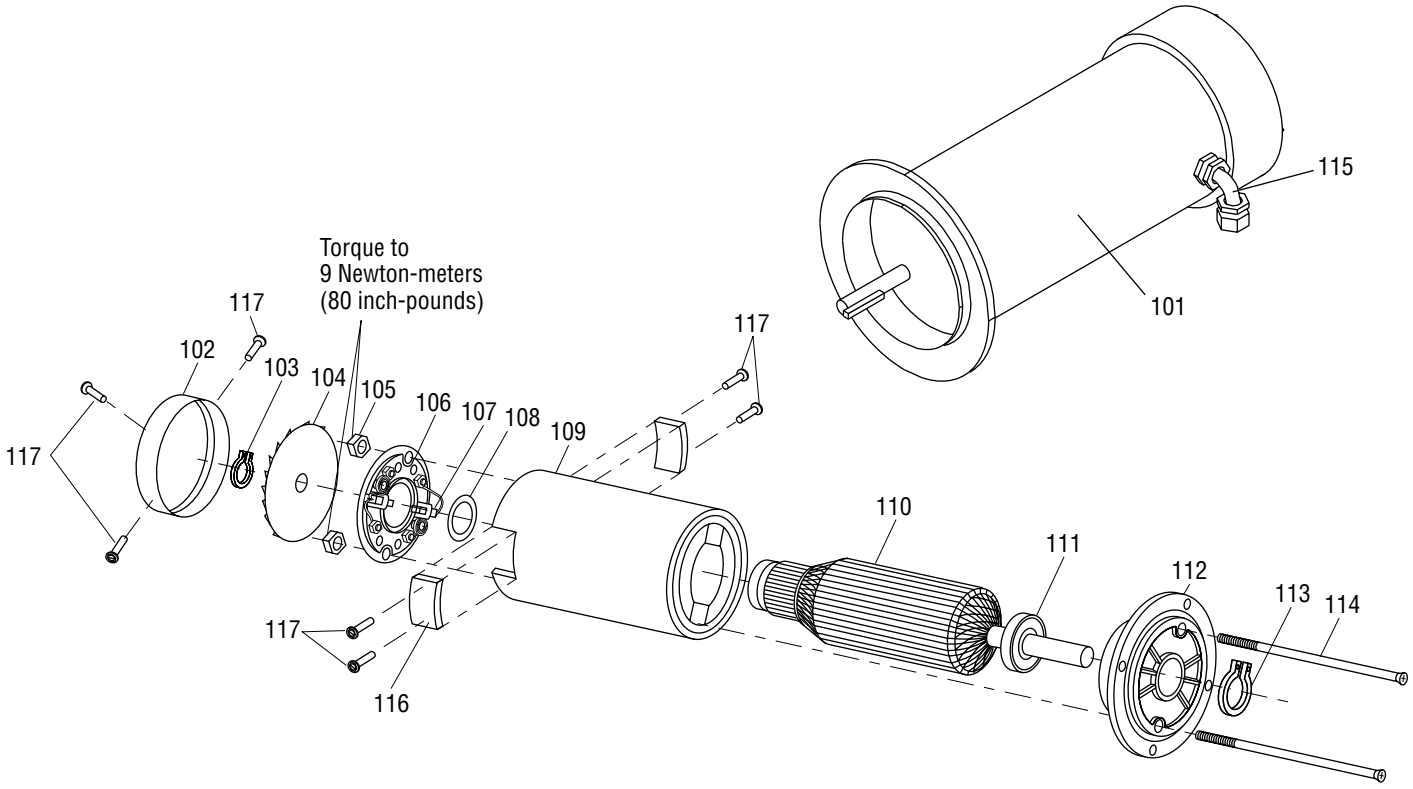
## Parts List — 555® Electric Bender (Serial Number AAJ7300 and above)

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 503 9742.7 | Weldment, Main Frame | 1 |
| 2 | 502 3452.8 | Washer, Fiber | 1 |
| 3 | 503 2896.4 | Weldment, Sprocket Unit | 1 |
| 4 | 905 2409.8 | Bearing, Fiberglide ø2.625 x 2.5 long | 1 |
| 5 | 905 2410.1 | Bearing, Fiberglide ø2.625 x 3.75 long | 1 |
| 6 | 905 2414.4 | Ring, Retaining #5100-237 | 1 |
| 7 | 905 2412.8 | Bearing, Fiberglide ø1.625 x 1.00 long | 2 |
| 8 | 503 9763.0 | Weldment, Countershaft | 1 |
| 9 | 905 4023.9 | Ring, Retaining #5100-250 | 1 |
| 10 | 503 9764.8 | Shaft, Counter | 1 |
| 11 | 905 2413.6 | Bearing, Thrust Fiberglide | 2 |
| 12 | 905 4548.6 | Sprocket, #40 60T | 1 |
| 13 | 905 4253.3 | Sprocket, #60 14T | 1 |
| 14 | 503 9765.6 | Key, Countershaft | 2 |
| 15 | 905 4546.0 | Chain, #60 87P | 1 |
| 16 | 905 4251.7 | Masterlink, #60 | 1 |
| 17 | 905 4547.8 | Sprocket, #40 13T | 1 |
| 18 | 503 9825.3 | Key, Reductor Sprocket | 1 |
| 19 | 905 2388.1 | Reductor, Worm Gear | 1 |
| 20 | 905 2787.9 | Masterlink, #40 | 1 |
| 21 | 905 4551.6 | Chain, #40 87P | 1 |
| 22 | 905 4568.0 | Bolt, 3/8–16 UNC x .75 | 7 |
| 23 | 503 9758.3 | Eccentric | 1 |
| 24 | 905 4237.1 | Bolt, 3/8–16 UNC x 1.00 | 5 |
| 25 | 918 6417.8 | Motor | 1 |
| 26 | 905 4549.4 | Conduit, Sealtight | 1 |
| 27 | 918 5214.5 | Elbow, Sealtight | 1 |
| 28 | 918 6683.9 | Strain Relief | 1 |
| 29 | 905 1170.0 | Nut, 3/4 Conduit Lock | 1 |
| 30 | 918 6767.3 | Strain Relief, Pendant Switch | 1 |
| 31 | 918 6263.9 | Nut, 1/2 Conduit Lock | 1 |
| 32 | 503 9757.5 | Axle | 1 |
| 34 | 905 1528.5 | Ring, Retaining #5160-75 | 2 |
| 35 | 905 5267.9 | Wheel, Urethane Filled | 2 |
| 36 | 503 9768.0 | Guard, Rear Lower | 1 |
| 37 | 503 9769.9 | Guard, Rear Upper | 1 |
| 38 | 503 9760.5 | Cover, Front | 1 |
| 39 | 905 1655.9 | Screw, #10–16 x .50 Hex Head | 31 |
| 40 | 905 0430.5 | Screw, #6–32 x .375 Phillips | 2 |
| 41 | 918 6385.6 | Switch, Air Pax | 1 |
| 42 | 502 9708.2 | Guard, Switch | 1 |
| 43 | 500 6905.5 | Nameplate | 1 |
| 44 | 905 3001.2 | Rivet, pop 1/8 x 1/8 Drive | 4 |

## Parts List — 555® Electric Bender (Serial Number AAJ7300 and above) (cont'd)

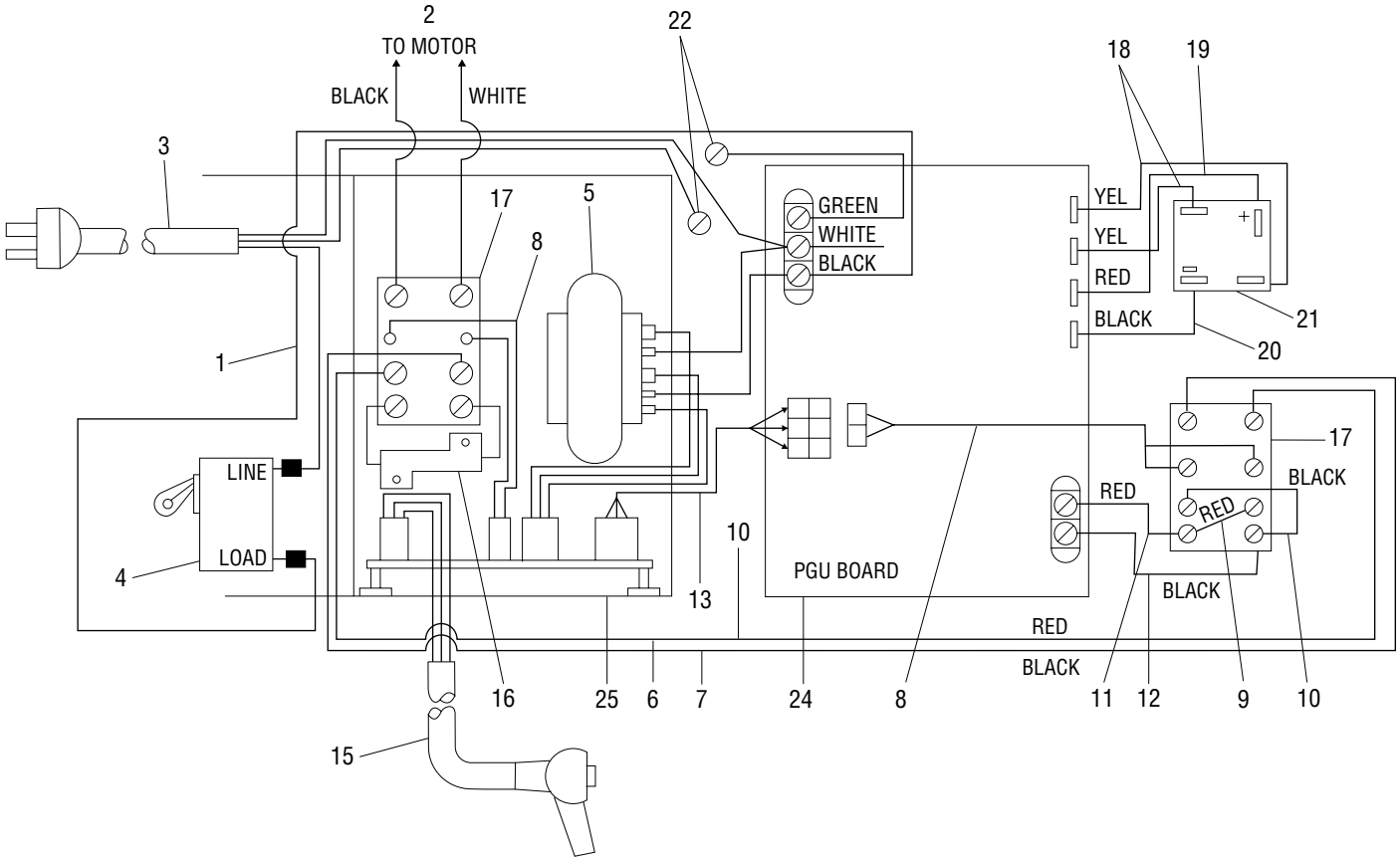
| Key | Part No. | Description | Qty. |
|---|---|---|---|
| 45 | 501 9053.9 | Decal, Voltage | 1 |
| 46 | 503 0392.9 | Decal, Damp Warning | 1 |
| 47 | 503 9759.1 | Cover, Top | 1 |
| 48 | 503 5191.5 | Decal, Safety | 1 |
| 49 | 905 3389.5 | Pin, Hitch | 2 |
| 50 | 905 2501.9 | Ring, Retaining #5100-287 | 1 |
| 52 | 905 4552.4 | Lanyard | 3 |
| 53 | 905 4545.1 | Pin, Hitch | 1 |
| 54 | 905 4335.1 | Screw, 1/4 x .37 Thread Forming | 14 |
| 55 | 503 9822.9 | Bracket, Mounting, Electrical | 1 |
| 57 | 503 3937.0 | Decal, Squeeze Adjust | 1 |
| 58 | 503 8974.2 | Decal, Circuit Breaker | 1 |
| 62 | 503 9839.3 | Switch, Pendant | 1 |
| 62A | 918 6449.6 | Switch, Center Off | 1 |
| 62B | 503 1902.7 | Handle, Right Half | 1 |
| 62C | 905 3441.7 | Screw, #6–20 x .625 Pan Head, Self-Tapping | 3 |
| 62D | 503 1901.9 | Handle, Left Half | 1 |
| 62E | 503 9837.7 | Cord | 1 |
| 62F | 503 5487.6 | Decal, Face Plate | 1 |
| 70 | 905 1740.7 | Washer, Flat | 2 |
| 71 | 500 2497.3 | Decal, Instruction | 1 |
| 77 | 905 1051.8 | Ring, Retaining #5100-150 | 2 |
| 78 | 905 5268.7 | Pin, Safety Snap | 2 |
| 79 | 503 9748.6 | Handle, Upper | 1 |
| 80 | 500 6919.5 | Sleeve, Axle | 2 |

## Exploded View and Parts List — 115 Volt Motor




| Key | Pacific Scientific Part No. | Description | Qty. |
|---|---|---|---|
| 101 | 918 6417.8 | Motor, 115 Volt (standard) | 1 |
| 102 | 918 6471.2 | Fan Cover | 1 |
| 103 | 905 5071.4 | Retaining Ring | 1 |
| 104 | 918 6432.1 | Fan | 1 |
| 105 | 918 6428.3 | End Bell Nut | 2 |
| 106 | 918 6419.4 | Bell, Rear End | 1 |
| 107 | 918 6420.8 | Brush | 2 |
| 108 | 918 6422.4 | Thrust Washer | 1 |
| 109 | 918 6427.5 | Shell and Magnet Assembly, 115V | 1 |
| 110 | 918 6425.9 | Armature, 115V | 1 |
| 111 | 918 6421.6 | Bearing Kit | 2 |
| 112 | 918 6418.6 | Bell, Front End | 1 |
| 113 | 918 6424.0 | Retaining Ring | 1 |
| 114 | 918 6426.7 | Tie Bolt, 115V | 2 |
| 115 | 918 5876.3 | 90° Connector | 1 |
| 116 | 918 6430.5 | Brush Cover | 2 |
| 117 | 918 6431.3 | Cover Screw | 7 |

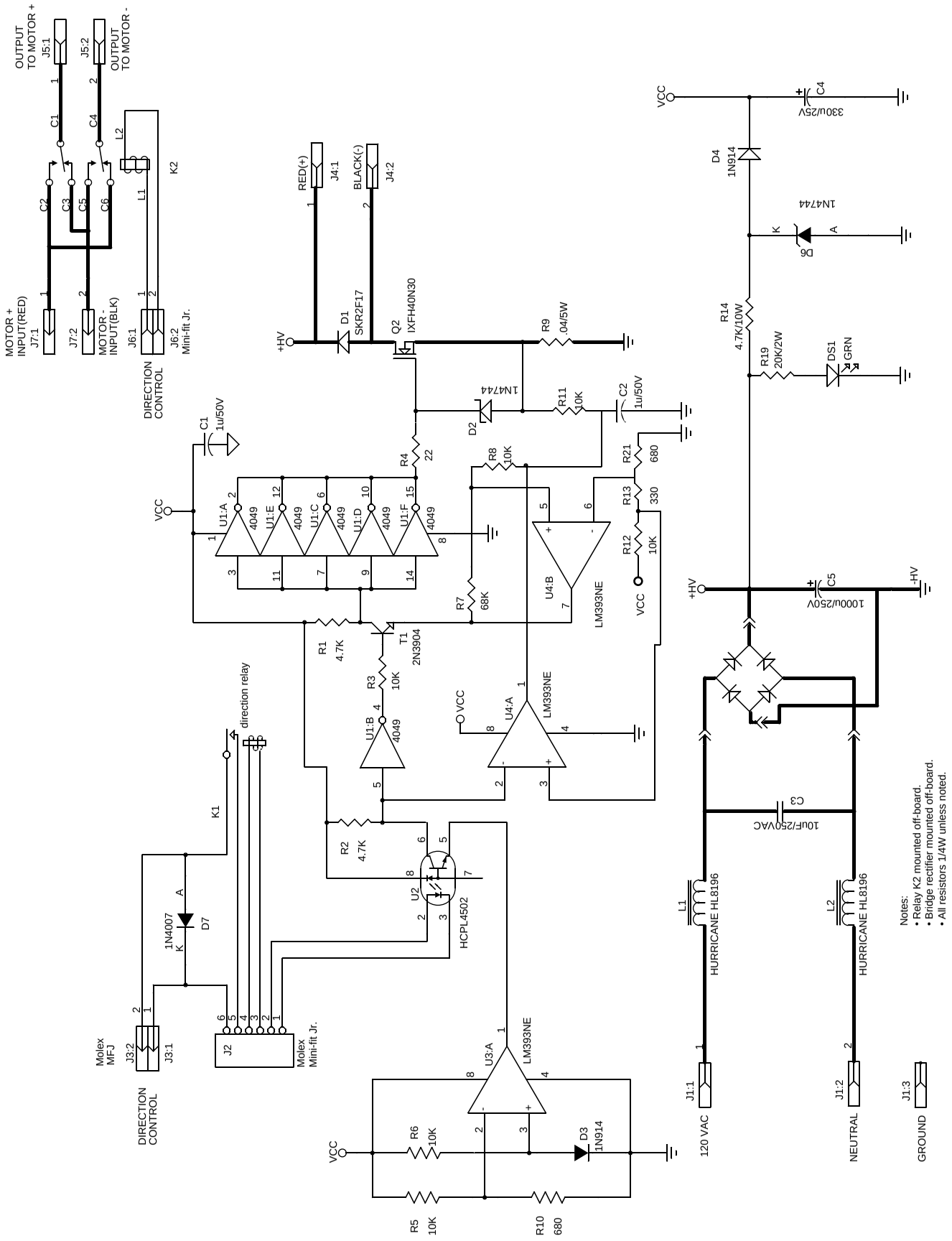
## Electrical Control System Layout




| Key | Part No. | Description |
|---|---|---|
| 1 | 503 8941.6 | PGU Power Wire |
| 2 | 918 6417.8 | Motor |
| 3 | 503 8603.4 | Power Cord |
| 4 | 918 6385.6 | Switch Circuit Breaker |
| 5 | 918 6769.0 | Transformer Unit |
| 6 | 503 9847.4 | Wire Unit, Red |
| 7 | 503 9848.2 | Wire Unit, Black |
| 8 | 503 8639.5 | Relay Wire Unit |
| 9 | 503 8640.9 | Red Relay Wire |
| 10 | 503 8175.0 | Black Relay Wire |
| 11 | 503 8961.0 | Red Relay, PGU Wire |
| 12 | 503 8960.2 | Black Relay, PGU Wire |

| Key | Part No. | Description |
|---|---|---|
| 13 | 503 9846.6 | IO-PGU Wire Unit |
| 14 | 503 8942.4 | Ground Jump Wire |
| 15 | 503 9839.3 | Switch Unit, Pendant |
| 16 | 918 6772.0 | Resistor Unit |
| 17 | 918 6645.6 | Contactor |
| 18 | 503 8643.3 | Yellow Rectifier Wires |
| 19 | 503 8642.5 | Red Rectifier Wire |
| 20 | 503 8641.7 | Black Rectifier Wire |
| 21 | 918 5997.2 | Rectifier |
| 22 | 905 4329.7 | Ground Screw |
| 24 | 503 8313.2 | Power Generation Board |
| 25 | 503 9845.8 | Input-Output Brake Control Assembly |

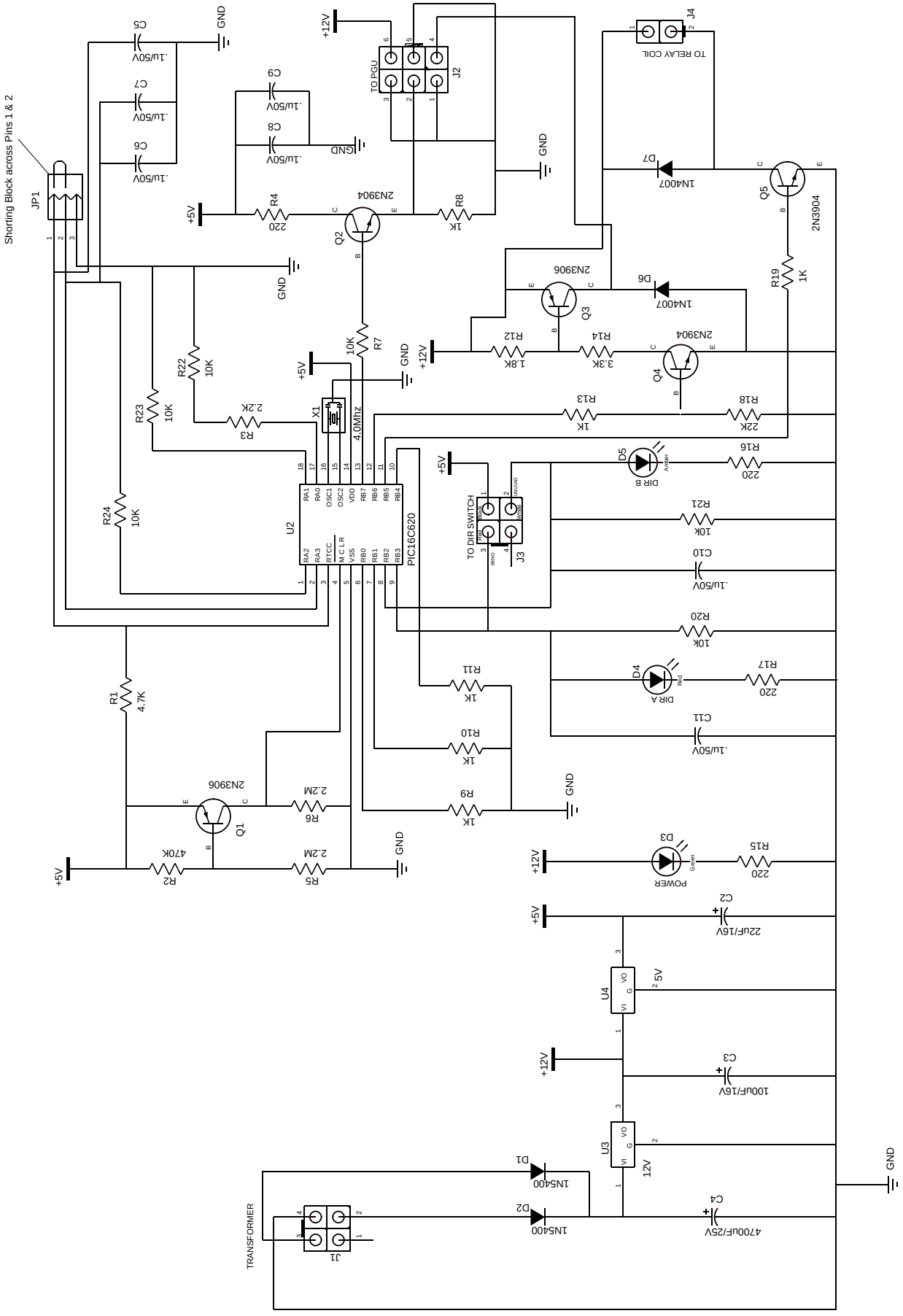
## Schematic Diagram — Power Generation Unit



## Parts List — Power Generation Unit

| Greenlee No. | Location | Description | Value | Manufacturer | Part No. |
|---|---|---|---|---|---|
| — | R1-R2 | Resistor | 4.7 KΩ / 1/4 w / 5% | — | — |
| — | R3, R5, R6, R8, R11, R12 | Resistor | 10 KΩ / 1/4 w / 5% | — | — |
| — | R4 | Resistor | 22 Ω / 1/4 w / 5% | — | — |
| — | R7 | Resistor | 68 KΩ / 1/4 w / 5% | — | — |
| — | R9 | Resistor | .04 Ω / 5 w / 1% | Dale | LVR-5 .04Ω |
| — | R13 | Resistor | 320 / 1/4 w / 5% | — | — |
| — | R14 | Resistor | 4.7 KΩ / 10 w / 5% | Dale | CW-10 4.7K |
| — | R10 | Resistor | 680 Ω / 1/4 w / 5% | — | — |
| — | R19 | Resistor | 20kΩ / 2w / 1% | Dale | RS-2B-20K |
| — | R21 | Resistor | 680 / 1/4 w / 5% | — | — |
| 918 6687.1 | D1 | Diode | — | Semikron | SKR2F17 |
| — | D2, D6 | Zener Diode | IN4744-DO-41 | Motorola | IN 4744 |
| — | D3, D4 | Diode | IN914 | Motorola | IN 914 |
| — | D7 | Diode | IN 4007 | Mototola | IN 4007 |
| — | C1, C2 | Capacitor | 1mf / 50v | Philips | CY-30 C105M |
| — | C3 | Capacitor | 10mf / 250 VAC | American | 10mf / 250VAC |
| — | C4 | Capacitor | 330mf / 25v | Nichicon | 1E331MPA |
| 918 6862.9 | C5 | Capacitor | 1000uF/250V | — | — |
| 918 6861.0 | Q2 | Mosfet | IXFH40N30 | IXYS | IXFH40N30 |
| 918 6688.0 | K1 | Relay | T81H5D312-05 | P & B | T81H5D312-05 |
| 918 6645.6 | Off Board | Relay | PRD-11DY0-12 | P & B | PRD-11DY0-12 |
| — | L1, L2 | Inductor | HL-8196 | Hurricane | HL-8196 |
| — | DSI | LED | LED T1-3/4 Green | HP | HLMP-3507 |
| 918 6690.1 | U1 | IC | 4049 | Motorola | MC14049UBCP |
| 918 6691.0 | U2 | OPTO-Isolator | GN136N | HP | HCPL4502 |
| 918 6692.8 | U3, U4 | IC | LM393 | Motorola | LM393AN |
| 918 5997.2 | Off Board | Rectifier | GBPC3504 | GI | GBPC3504 |
| — | D1 | Heat Sink | — | Wakefield | 695-1 |
| 503 8270.5 | Off Board | Heat Sink | — | Greenlee | — |
| — | J1 | Connector | — | Beau | 72503 |
| — | J2 | Connector | Mini-Fit Jr. | Molex | 39-28-1063-P |
| — | J3, J7 | Connector | Mini-Fit Jr. | Molex | 39-28-1023-P |
| — | J4 | Connector | — | Beau | 72502 |
| 918 6693.6 | T1 | Transistor | 2N3904 | Motorola | 2N3904 |

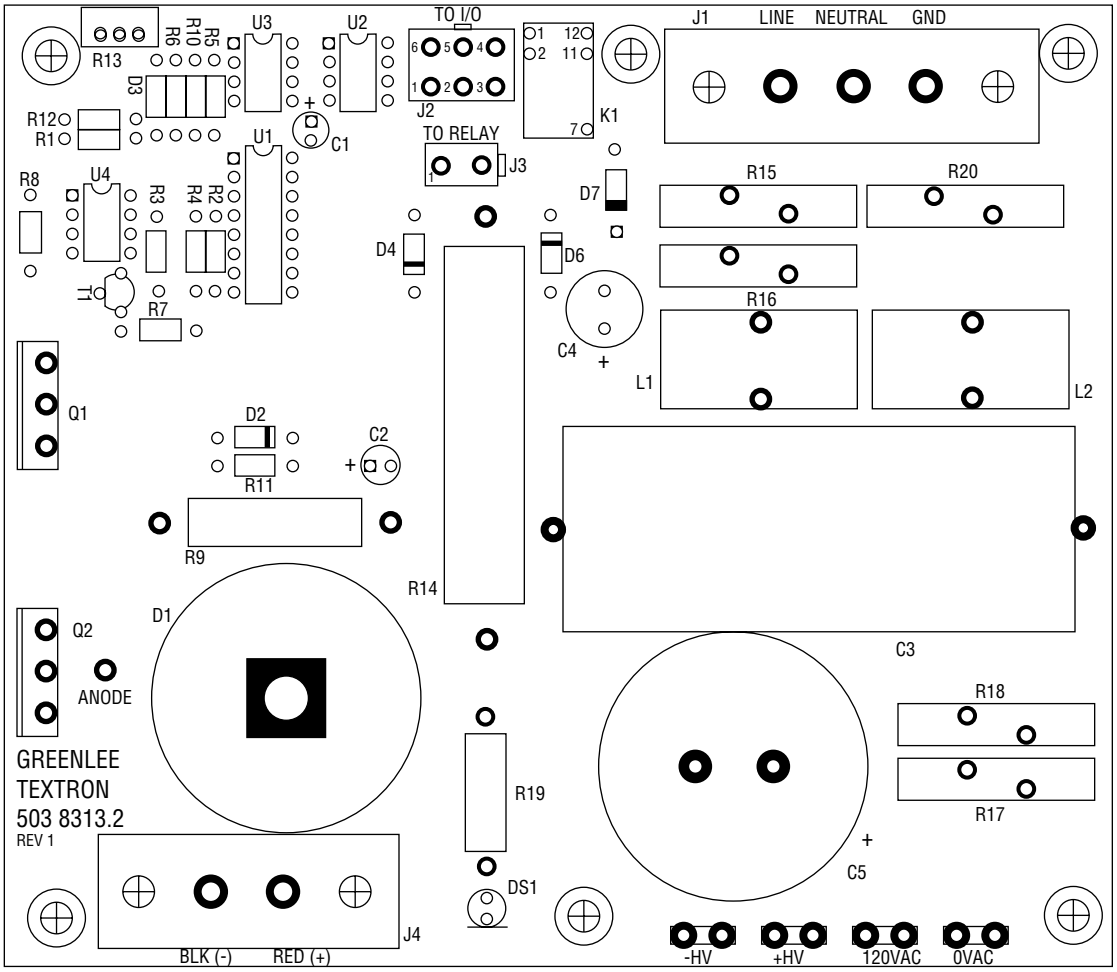
## Schematic Diagram — IO Microprocessor



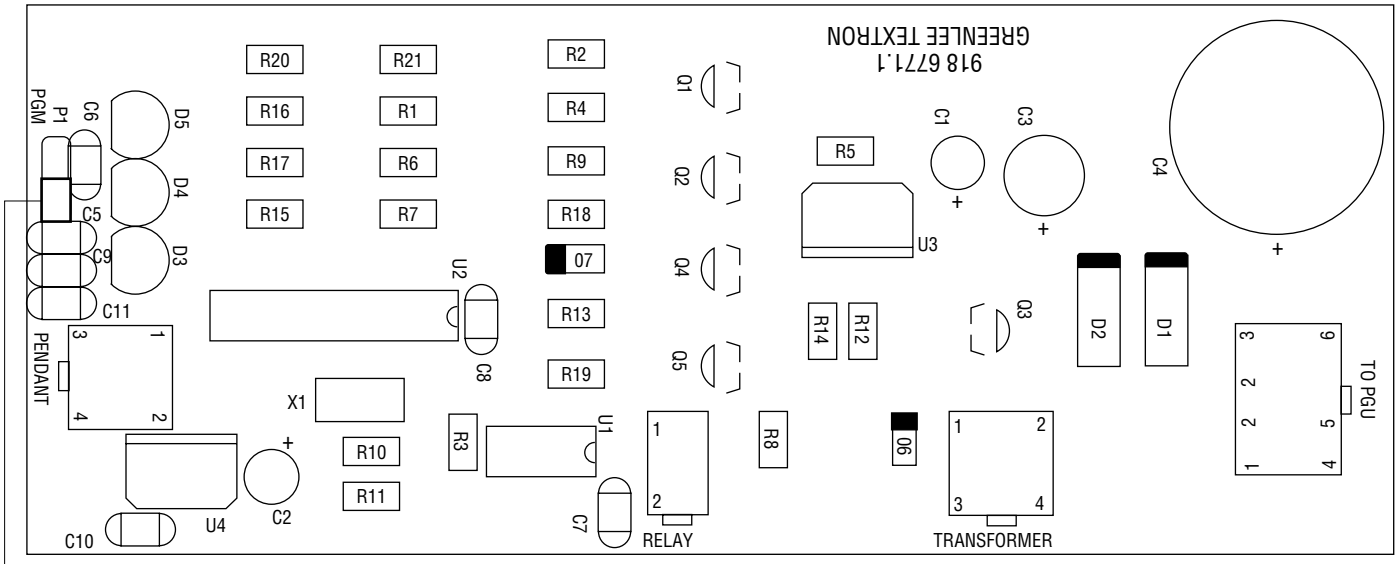
## Parts List — IO Microprocessor

| Quantity | Location | Description | Manufacturer | Part No. |
|---|---|---|---|---|
| 2 | D6, 7 | IN4007 | Motorola | IN4007 |
| 2 | D1, 2 | IN5400 | Motorola | IN5400 |
| 3 | Q2, 4, 5 | 2N3904 | Motorola<br>SGS Thomson | 2N3904<br>2N3904 |
| 2 | Q1, 3 | 2N3906 | Motorola<br>SGS Thomson | 2N3906<br>2N3906 |
| 7 | C5-11 | .1U/50V | Philips | CY-20C104M |
| 1 | P1 | 1x3 Connector | Molex | 22-03-2031 |
| 1 | D3 | Green LED | Panasonic | LN31GPHL |
| 1 | D4 | Red LED | Panasonic | LN21RPHL |
| 1 | D5 | Amber LED | Panasonic | LN41YPHL |
| 1 | U3 | 12V Reg | Motorola<br>SGS Thomson | MC7812CT<br>L7812CV |
| 1 | U4 | 5V Reg | Motorola<br>SGS Thomson | MC7805CT<br>L7805CV |
| 1 | J4 | MF J2 Connector | Molex | 3902801023 |
| 1 | J1, 3 | MF J4 Connector | Molex | 39-28-1043 |
| 1 | J2 | MF J6 Connector | Molex | 39028-1063 |
| 1 | U2 | Programmed PIC16C620 | Greenlee Textron | 918 6869.6 |
| 1 | C2 | 22UF/16V | Nichicon | UKB1C220KAA |
| 1 | C3 | 100UF/16V | Nichicon | UKB1C101KPA |
| 1 | C4 | 4700UF/25V | Panasonic | ECO-S1EP472AA |
| 1 | R1 | 4.7K/.25W/5% | Carbon Film (C.F.) | |
| 6 | R8-11, 13, 19 | 1K/.25W/5% | C.F. | |
| 1 | R12 | 1.8K/.25W/5% | C.F. | |
| 1 | R14 | 3.3K/.25W/5% | C.F. | |
| 2 | R3, 15 | 2.2K/.25W/5% | C.F. | |
| 3 | R4, 16, 17 | 220/.25W/5% | C.F. | |
| 1 | R18 | 22K/.25W/5% | C.F. | |
| 1 | R2 | 470K/.25W/5% | C.F. | |
| 1 | R7, 20, 21 | 10K/.25W/5% | C.F. | |
| 2 | R5, R6 | 2.2M/.25W/5% | C.F. | |
| 1 | X1 | 4 MHZ Resonator | Panasonic<br>Murata | EFO-GC4004A4<br>CST - 4.00 MWG |
| 1 | | PC Board | FR4, Double-Sided, 0.062" | |
| 1 | U2 | 18 pin .3 DIP Socket | Various | |
| 1 | P1 | 2 pin Shorting Block across Pins 1 & 2 | Various | |

## Layout Diagram — Power Generation Board




## Layout Diagram — IO and Microprocessor Board



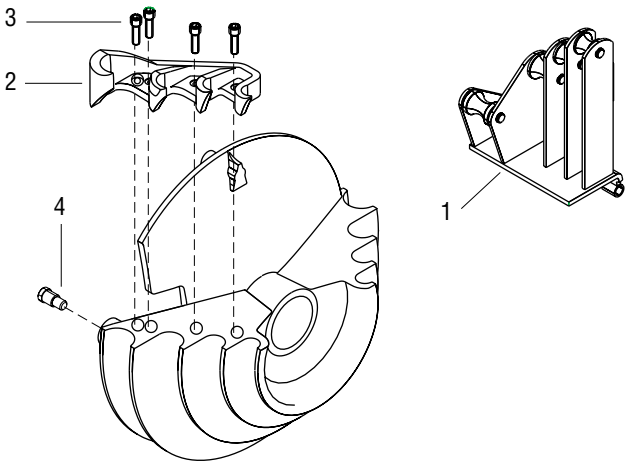

Shorting Block across Pins 1 & 2

# Bending Shoes and Roller Supports

**Bending Shoe and Roller Support**
**1/2" to 1-1/4" IMC and Rigid Conduit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 500 0936.2 | Roller Support, 1/2" to 1-1/4" IMC and Rigid | 1 |
| | 500 0571.5 | Bending Shoe Assembly (includes items 2–4) | 1 |
| 2 | 500 0569.3 | Hook | 1 |
| 3 | 905 1088.7 | 3/8–16 UNC x 1-1/4" Socket Head Cap Screw | 4 |
| 4 | 502 3422.6 | Stud, Drive | 3 |

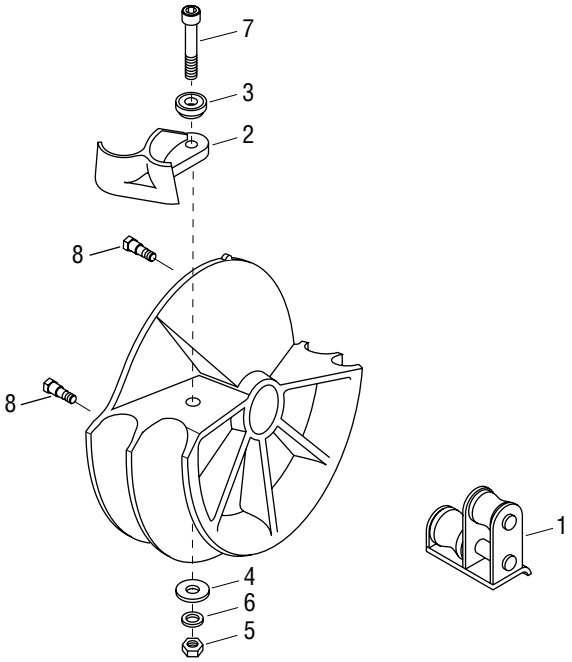
*Shoe not available separately.*




**Bending Shoe and Roller Support**
**1-1/2" to 2" Rigid Conduit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 501 7984.5 | Roller Support, 1-1/2" to 2" Rigid Conduit | 1 |
| | 501 7937.3 | Bending Shoe Assembly, 1-1/2" to 2" Rigid Conduit (includes items 2–8) | 1 |
| 2 | 501 7969.1 | Pipe Hook | 1 |
| 3 | 501 7974.8 | Pivot | 1 |
| 4 | 905 2675.9 | 5/8 Flat Washer | 1 |
| 5 | 905 1569.2 | 5/8–11 UNC Hex Nut | 1 |
| 6 | 905 0905.6 | 5/8 Split Lockwasher | 1 |
| 7 | 905 2426.8 | 5/8–11 UNC x 4" Socket Head Cap Screw | 1 |
| 8 | 502 3422.6 | Stud, Drive | 4 |

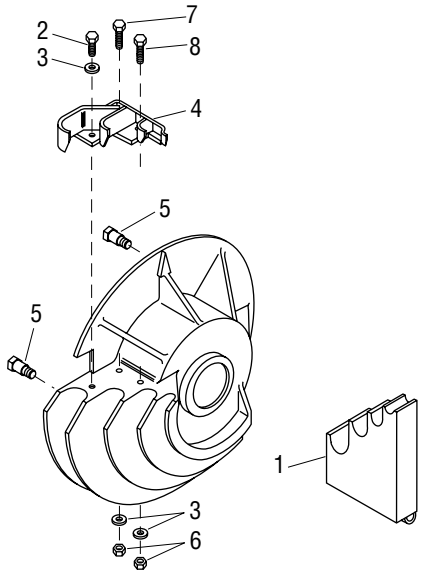
*Shoe not available separately.*



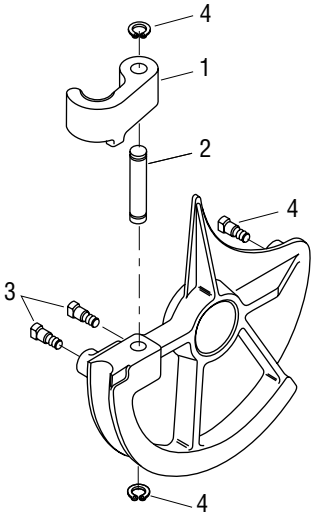

**Bending Shoe and Pipe Rest**
**1/2" to 1-1/4" EMT Conduit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 501 7986.1 | Pipe Rest Assembly for 1/2" to 1-1/4" EMT Conduit | 1 |
| | 501 7944.6 | Bending Shoe Assembly for 1/2" to 2-1/4" EMT Conduit (includes items 2–8) | 1 |
| 2 | 905 0597.2 | 3/8–16 UNC x Socket Head Cap Screw | 1 |
| 3 | 905 0506.9 | 3/8 Lockwasher (split) | 3 |
| 4 | 502 4555.4 | Pipe Hook | 1 |
| 5 | 502 3422.6 | Stud, Drive | 4 |
| 6 | 905 0639.1 | 3/8–16 UNC Hex Nut, Cad. Plated | 2 |
| 7 | 905 0532.8 | 3/8–16 UNC x 1-1/4 SAE Grade 5 Socket Head Cap Screw | 1 |
| 8 | 905 1088.7 | 3/8–16 UNC x 1-1/4 Socket Head Screw | 1 |

*Shoe not available separately.*

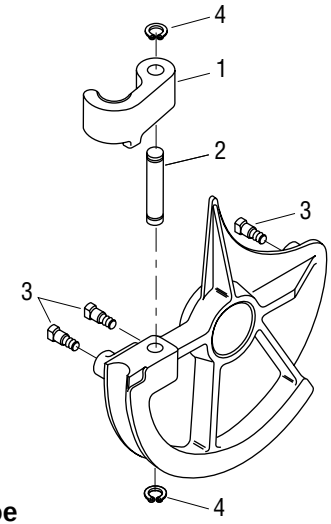


## Bending Shoes and Roller Supports (cont'd)



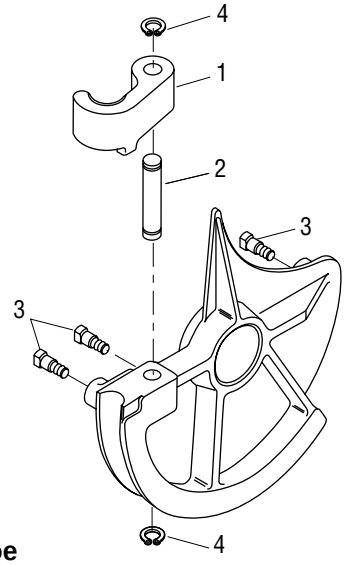

**Bending Shoe**
**1-1/2" EMT Conduit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| | 502 3499.4 | Shoe Unit, 1-1/2" EMT (includes items 1–4) | 1 |
| 1 | 501 8820.8 | Hook, 1-1/2" EMT | 1 |
| 2 | 501 8841.0 | Pin, 1-1/2" EMT Hook | 1 |
| 3 | 502 3422.6 | Stud, Drive | 3 |
| 4 | 905 1529.3 | Ring, Tru-Arc #5160-87 Retaining | 2 |



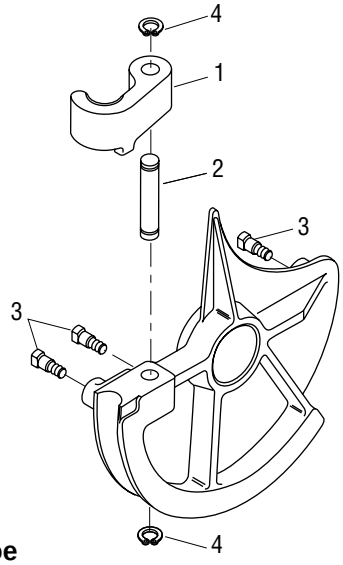

**Bending Shoe**
**1-1/2" IMC Conduit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| | 502 5363.1 | Shoe Unit, 1-1/2" IMC (includes items 1–4) | 1 |
| 1 | 501 8811.9 | Hook, 1-1/2" IMC | 1 |
| 2 | 501 8837.2 | Pin, 1-1/2" IMC | 1 |
| 3 | 502 3422.6 | Stud, Drive | 3 |
| 4 | 905 1528.5 | Ring, Tru-Arc Retaining | 2 |




**Bending Shoe**
**2" EMT Conduit**

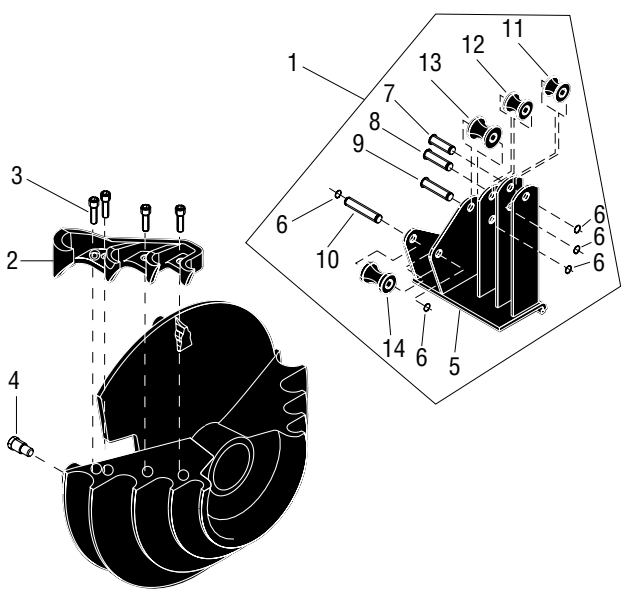
| Key | Part No. | Description | Qty. |
|---|---|---|---|
| | 502 3505.2 | Shoe Unit, 2" EMT Conduit (includes items 1–4) | 1 |
| 1 | 501 8818.6 | Hook, 2" EMT | 1 |
| 2 | 501 8842.9 | Pin, 2" EMT Hook | 1 |
| 3 | 502 3422.6 | Stud, Drive | 3 |
| 4 | 905 1529.3 | Ring, Tru-Arc #5160-87 Retaining | 2 |

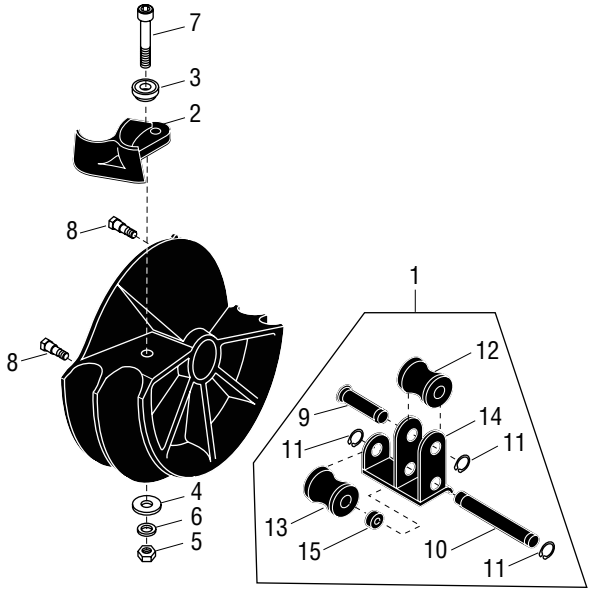



**Bending Shoe**
**2" IMC Conduit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| | 502 5268.2 | Shoe Unit, 2" IMC (includes items 1–4) | 1 |
| 1 | 500 0195.7 | Hook, 2" IMC | 1 |
| 2 | 501 8842.9 | Pin, 2" IMC | 1 |
| 3 | 502 3422.6 | Stud, Drive | 3 |
| 4 | 905 1529.3 | Ring, Tru-Arc Retaining | 2 |

## Bending Shoes and Roller Supports (cont'd)



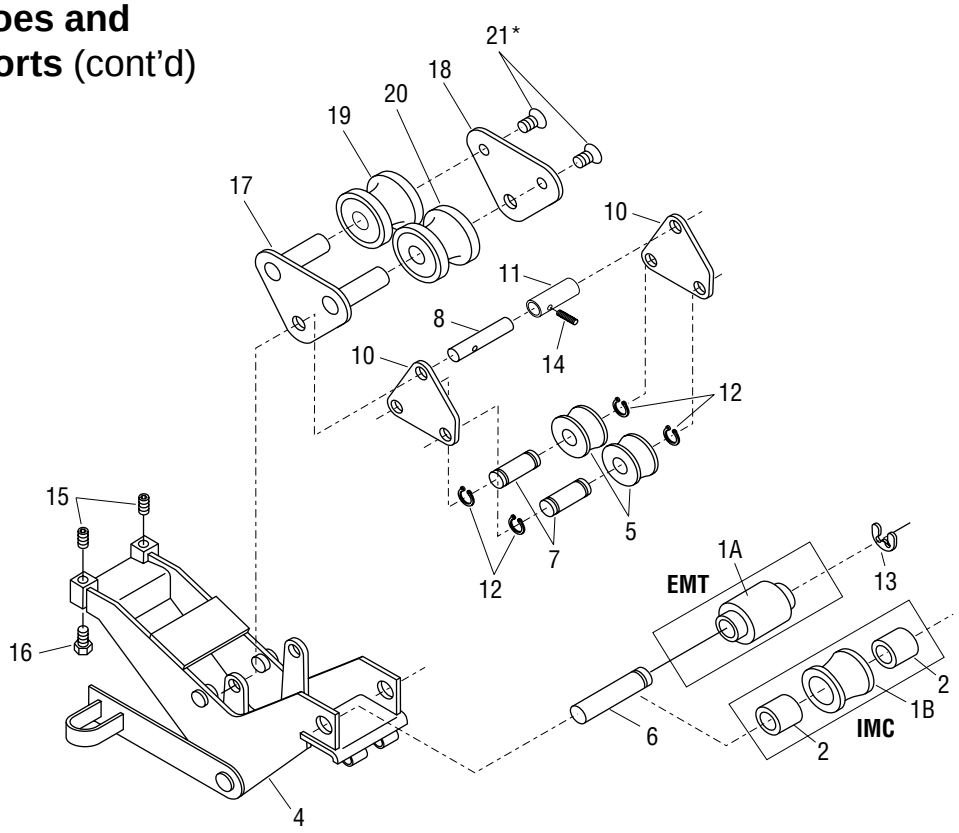

**Bending Shoe and Roller Support**
**1/2" to 1-1/4" 40 Mil PVC-Coated Rigid Conduit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 500 0946.0 | Roller Support, 1/2" to 1-1/4" PVC-Coated Rigid (includes items 5–14) | 1 |
| | 500 0573.1 | Bending Shoe Assembly, 1/2" to 1-1/4" PVC-Coated Rigid (includes items 2–4) | 1 |
| 2 | 500 0570.7 | Hook | 1 |
| 3 | 905 1088.7 | 3/8–16 UNC x 1-1/4" Socket Head Cap Screw | 4 |
| 4 | 502 3422.6 | Stud, Drive | 3 |
| 5 | 500 0945.1 | Support Weldment, Roller | 1 |
| 6 | 905 1353.3 | Retaining Ring | 5 |
| 7 | 500 0923.0 | 1/2" Roller Axle | 1 |
| 8 | 500 0924.9 | 3/4" Roller Axle | 1 |
| 9 | 500 0925.7 | 1" Roller Axle | 1 |
| 10 | 500 0926.5 | 1-1/4" Roller Axle | 1 |
| 11 | 500 0927.3 | 1/2" Roller | 1 |
| 12 | 500 0928.1 | 3/4" Roller | 1 |
| 13 | 500 0929.0 | 1" Roller | 1 |
| 14 | 500 0930.3 | 1-1/4" Roller | 1 |

**Bending Shoe and Roller Support**
**1-1/2" to 2" 40 Mil PVC-Coated Rigid Conduit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 503 7282.3 | Roller Support, 1-1/2" to 2" PVC-Coated Rigid (includes items 9–15) | 1 |
| | 503 7281.5 | Bending Shoe Assembly, 1-1/2" to 2" PVC (includes items 2–8) | 1 |
| 2 | 500 2499.0 | Hook | 1 |
| 3 | 501 7974.8 | Pivot | 1 |
| 4 | 905 2675.9 | 5/8" Flat Washer | 1 |
| 5 | 905 1569.2 | 5/8–11 UNC Hex Nut | 1 |
| 6 | 905 0905.6 | 5/8" Lockwasher | 1 |
| 7 | 905 2426.8 | 5/8–11 UNC x 4" Socket Head Cap Screw | 1 |
| 8 | 502 3422.6 | Stud, Drive | 4 |
| 9 | 503 7662.4 | 1-1/2" Shaft | 1 |
| 10 | 503 7661.6 | 2" Shaft | 1 |
| 11 | 905 1528.5 | Retaining Ring | 3 |
| 12 | 503 7284.0 | 1-1/2" Roller | 1 |
| 13 | 503 7283.1 | 2" Roller | 1 |
| 14 | 503 7664.0 | Support Weldment | 1 |
| 15 | 503 2025.4 | Spacer | 1 |

## Bending Shoes and Roller Supports (cont'd)




**EMT Roller Support Unit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| | 502 3541.9 | Support Unit, 1-1/2" and 2" EMT Roller (includes all of the following) | 1 |
| 1A | 502 7983.1 | Roller Unit, Cushioned | 1 |
| 4 | 502 3539.7 | Frame Unit | 1 |
| 5 | 502 3510.9 | Roller, 1-1/2" EMT | 2 |
| 6 | 502 3511.7 | Pin, Roller Support | 1 |
| 7 | 502 3932.5 | Pin, 1-1/2" EMT Roller | 2 |
| 8 | 502 3517.6 | Pin, Roller Pivot | 1 |
| 10 | 502 3524.9 | Plate, 1-1/2" EMT Pivot | 2 |
| 11 | 502 3793.4 | Spacer | 1 |
| 12 | 905 1528.5 | Ring, Retaining | 4 |
| 13 | 905 2464.0 | Ring, Tru-Arc #X5133-98 External Series "E" Retaining | 1 |
| 14 | 905 1491.2 | Rollpin, #59, -040-187-1250 | 1 |
| 15 | 905 2848.4 | Screw, 1/2–13 UNC x 3/4 Cup Pt. Skt. Set | 2 |
| 16 | 905 0542.5 | Screw, 1/2–13 UNC x 1 Hex Head Cap | 2 |
| 17 | 503 4964.3 | Support Weldment, 2" Roller | 1 |
| 18 | 503 4965.1 | Plate, 2" Inner Roller Support | 1 |
| 19 | 502 3519.2 | Roller, 2" EMT Front | 1 |
| 20 | 502 3792.6 | Roller, 2" EMT Back | 1 |
| 21* | 905 3394.1 | Screw, 7/16–14 UNC x 1 Flat Head | 2 |

**IMC Roller Support Unit**

| Key | Part No. | Description | Qty. |
|---|---|---|---|
| | 502 5273.9 | Support Unit, 1-1/2" and 2" IMC Roller (includes items 1 and 2) | 1 |
| 1B | 502 8334.0 | Roller | 1 |
| 2 | 502 8335.9 | Spacer | 2 |
| 4 | 502 6325.0 | Frame Unit | 1 |
| 5 | 502 5274.7 | Roller, 1-1/2" IMC | 2 |
| 6 | 502 3511.7 | Pin, Roller Support | 1 |
| 7 | 502 3932.5 | Pin, 1-1/2" IMC Roller | 2 |
| 8 | 502 3517.6 | Pin, Roller Pivot | 1 |
| 10 | 502 3524.9 | Plate, 1-1/2" IMC Pivot | 2 |
| 11 | 502 3793.4 | Spacer | 1 |
| 12 | 905 1528.5 | Ring, Retaining | 4 |
| 13 | 905 2464.0 | Ring, Tru-Arc #X5133-98 External Series "E" Retaining | 1 |
| 14 | 905 1491.2 | Rollpin, #59, -040-187-1250 | 1 |
| 15 | 905 2848.4 | Screw, 1/2–13 UNC x 3/4 Cup Pt. Skt. Set | 2 |
| 16 | 905 0542.5 | Screw, 1/2–13 UNC x 1 Hex Head Cap | 2 |
| 17 | 503 4964.3 | Support Weldment, 2" Roller | 1 |
| 18 | 503 4965.1 | Plate, 2" Inner Roller Support | 1 |
| 19 | 502 5279.8 | Roller, 2" IMC | 2 |
| 21* | 905 3394.1 | Screw, 7/16–14 UNC x 1 Flat Head | 2 |

*Key No. 21 must be torqued to 54 to 61 Newton-meters (40 to 45 foot-pounds).

GREENLEE TEXTRON

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