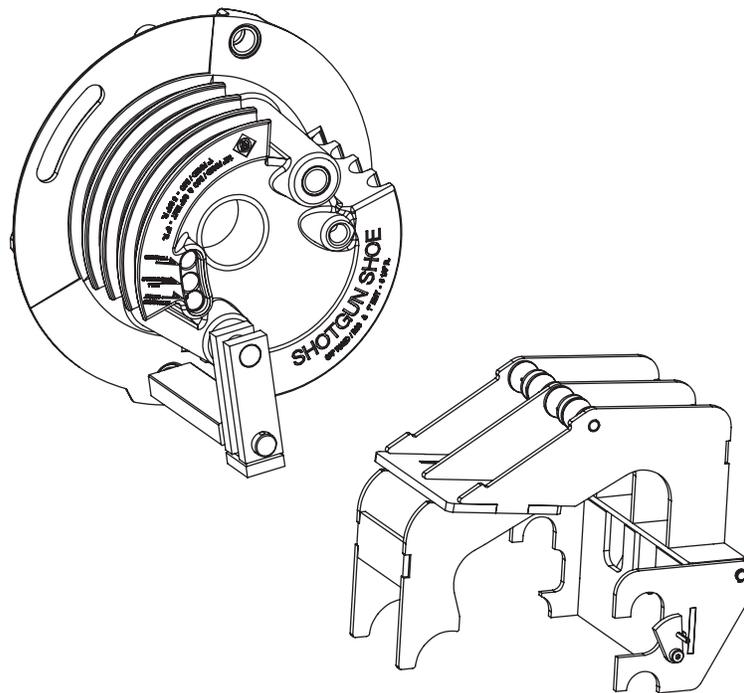


INSTRUCTION MANUAL



SG4-854 Shotgun Shoe Group for 854DX Electric Bender



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

Register this product at www.greenlee.com



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Description

The Greenlee SG4-854 Shotgun Shoe Group is intended to bend four sticks of conduit on the Greenlee 854DX Electric Bender. The shotgun shoe includes accessories for bending four sticks of the following types of conduit:

- 1/2" to 1" rigid
- 1/2" to 1" IMC
- 3/4" and 1" EMT

The SG4-854 also includes a length stop for fast setup of identical bends.

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 of this Manual

This manual is intended to familiarize all personnel with the safe operation and setup procedures for the Greenlee SG4-854 Shotgun Shoe Group.

Keep this manual available to all personnel.

Replacement manuals are available upon request at no charge at www.greenlee.com.

Other Publications

For additional information on safe operation and maintenance procedures, refer to the 854DX manuals listed below:

- Publication 52067681 – Instruction Manual
- Publication 52067682 – Service Manual



Do not discard this product or throw away!

For recycling information, go to www.greenlee.com.

All specifications are nominal and may change as design improvements occur. Greenlee Tools, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

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. Refer also to the 854DX bender manuals, which are listed under "Other Publications."

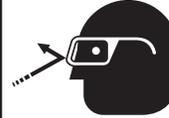
Failure to observe this warning will result in severe injury or death.



⚠ 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

Always use safety glasses. Everyday glasses only have impact resistant lenses; they are **NOT** safety glasses. When using in dusty environment, use face or dust mask.

Failure to wear eye protection could 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.
- Support conduit when unloading. Conduit can become loose and fall if not properly supported.

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

⚠ WARNING

- Reduce the risk of unintentional starting. Make sure switch is in off position before plugging in.
- Never leave tool running unattended. Turn power off. Do not leave tool until it comes to a complete stop.
- Disconnect tools before servicing and when changing accessories such as shoes, rollers, and the like. Accidental start-up could result in serious injury.

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

⚠ WARNING

- Never stand on tool. Serious injury could occur if the tool is tipped.
- Do not overreach. Keep proper footing and balance at all times.

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



IMPORTANT SAFETY INFORMATION

⚠ 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.
- Wear proper apparel. Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
- Do not force rollers or alter tool. It will do the job better and safer at the rate for which it was designed.
- Use right tool. Do not force tool or attachment to do a job for which it was not designed.
- 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 may result in injury or property damage.

⚠ CAUTION

- Keep work area clean. Cluttered areas and benches invite accidents.
- Keep children away. All visitors should be kept safe distance from work area.
- Make workshop kid proof with padlocks, master switches, or by removing starter keys.

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

⚠ CAUTION

- 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.
- Maintain tools with care. Keep tool clean for best and safest performance. Follow instructions for lubricating and changing accessories.
- Check damaged parts. Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
- Use recommended accessories. Consult the instruction manual for recommended accessories. The use of improper accessories may cause risk of injury to persons.
- Some bender parts and accessories are heavy and may require more than one person to lift and assemble.

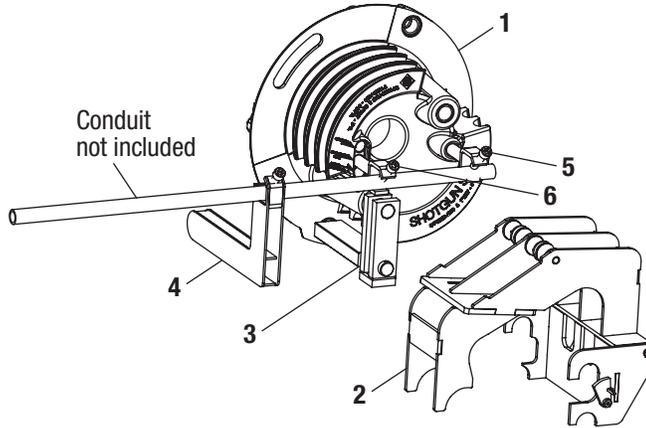
Failure to observe these precautions may result in injury or property damage.

Note: Keep all decals clean and legible, and replace when necessary.



Bending Attachment Group

RIGID, IMC, and EMT

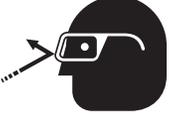


**04034: 1/2" to 1" Rigid
 1/2" to 1" IMC
 3/4" and 1" EMT**

Key	UPC No. 78-3310-	Description
1	04027	Bending shoe
2	04028	Roller support unit
3	02465	Hook assembly
4	04029	Length indicator (includes 5 and 6)
5		Long clamp
6		Short clamp
	23818	Storage box
	04030	Adapter kit



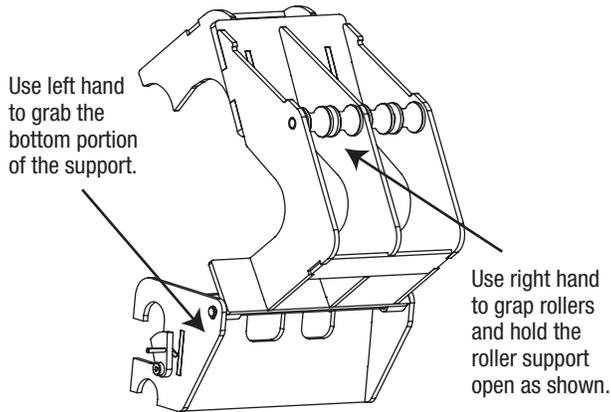
Setup

	⚠ WARNING
	<p>Always use safety glasses. Everyday glasses only have impact resistant lenses; they are NOT safety glasses. When using in dusty environment, use face or dust mask.</p> <p>Failure to wear eye protection could result in serious eye injury from flying debris.</p>

⚠ WARNING
<p>Unplug the bender before changing accessories. Accidental start-up could result in serious injury.</p>

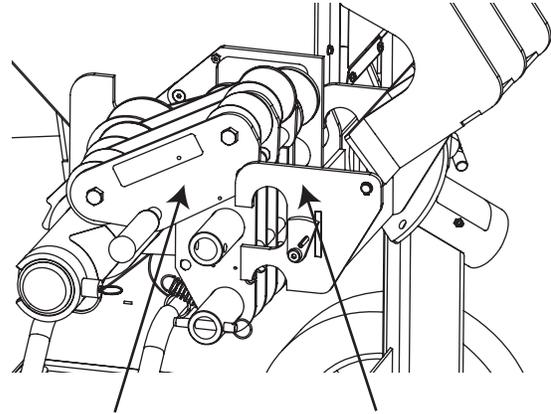
INSTALLING THE ROLLER SUPPORT

1. Grab the roller support with two hands as described below.



2. Align the right plate of the support with the bender roller plate as shown in the steps below.

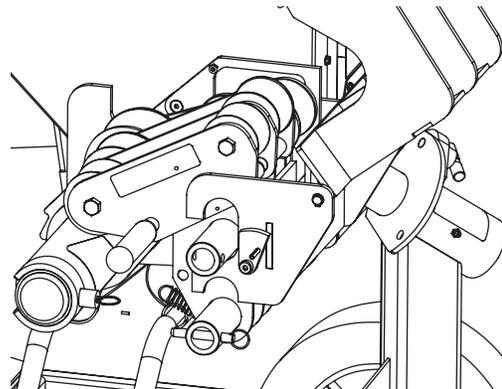
Step 1:



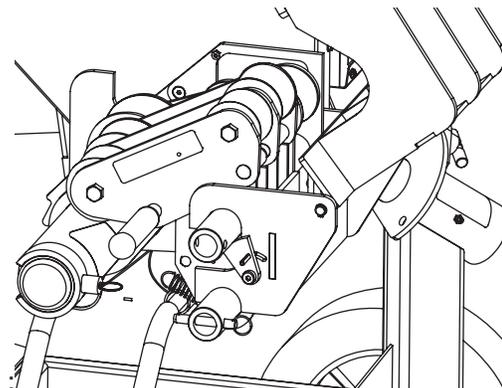
This bender roller plate should be on the inside of the roller support.

This plate from the roller support should be on the outside of the bender roller plate.

Step 2:



Step 3:

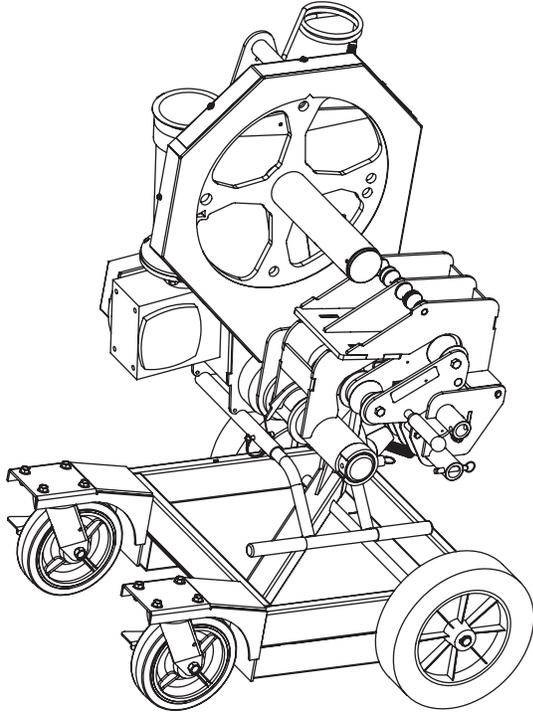




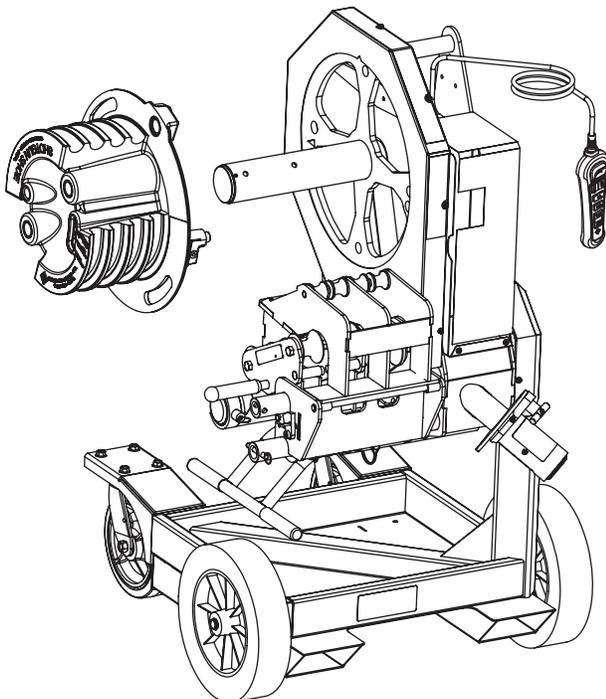
Setup (cont'd)

INSTALLING A SHOTGUN BENDING SHOE

1. Rotate the support to sit on the eccentric shaft, as shown.

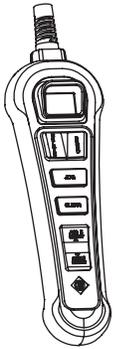


2. Slide the shotgun bending shoe onto the shaft of the main sprocket, as shown. Align the four drive studs on the back of the shoe with the four holes in the main sprocket. Make sure to align the drive stud with the cap with the bigger hole on the bender.



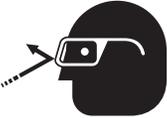
PENDANT SETUP

1. Attach the pendant cord to the receptacle located on the back of the bender.
2. Turn on the power to the bender.
3. Press and hold the **CLEAR** button on the pendant; then in addition press and hold the **ANGLE SELECT ▲** button.
4. Continue to hold both buttons until the text "SHOTGUN" scrolls across the pendant and the last decimal point on the pendant is on continuously. The buttons must be held for approximately 2 seconds. The second decimal point will remain on while the bender is in SHOTGUN mode.
5. Load the conduit into the proper shoe groove.
6. Press **BEND** momentarily until the shoe rotates enough so that the conduit is snug in the hook.
7. Press and hold the **CLEAR** button for 3 seconds to make the pendant read "00".
8. Using the supplied bending table for the SG4-854, bend the conduit until the pendant reads the appropriate degree.





Operation

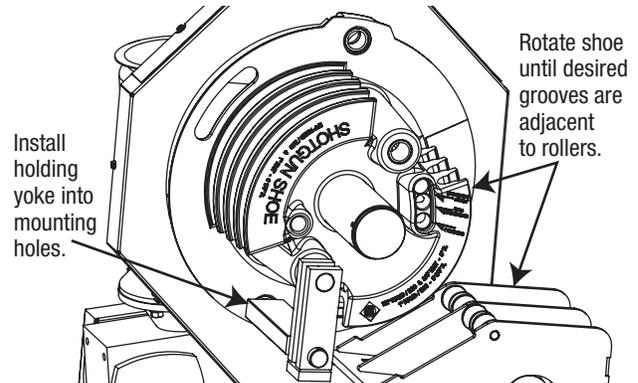
	⚠ WARNING
	<p>Always use safety glasses. Everyday glasses only have impact resistant lenses; they are NOT safety glasses. When using in dusty environment, use face or dust mask.</p> <p>Failure to wear eye protection could result in serious eye injury from flying debris.</p>

	⚠ WARNING
	<p>Pinch points: Keep hands away from bending shoe, rollers, and conduit when bender is in use.</p> <p>Failure to observe this warning could result in severe injury or death.</p>

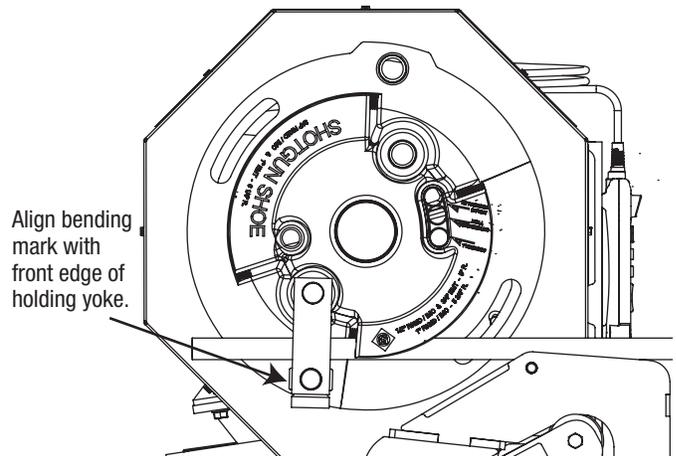
⚠ CAUTION
<p>Wear proper apparel. Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.</p> <p>Failure to observe this precaution may result in injury or property damage.</p>

BENDING CONDUIT

1. Plug the bender into a grounded 20 amp outlet. Refer to the 854DX bender instruction manual.
2. Turn on the bender's main power switch.
3. Press **UNLOAD** on the pendant until the shoe grooves for the desired conduit size and type are adjacent to the rollers.
4. Install the shoe hook into the two mounting holes, as shown.



5. Load the conduit so that the bending mark is aligned with the front edge of the holding yoke, as shown.



6. Refer to the "Bending Instructions" section of this manual or the Scale Reading Tables decal on the bender for the appropriate bend scale reading.
7. Bend the conduit. (Refer to "Pendant Setup" for button instruction.)
8. Press **UNLOAD** to rotate the shoe backwards approximately 10° to remove the load on the hook.
9. Remove the holding yoke and conduit from the shoe.
10. Press and hold **UNLOAD** until the shoe has rotated back to the load position.

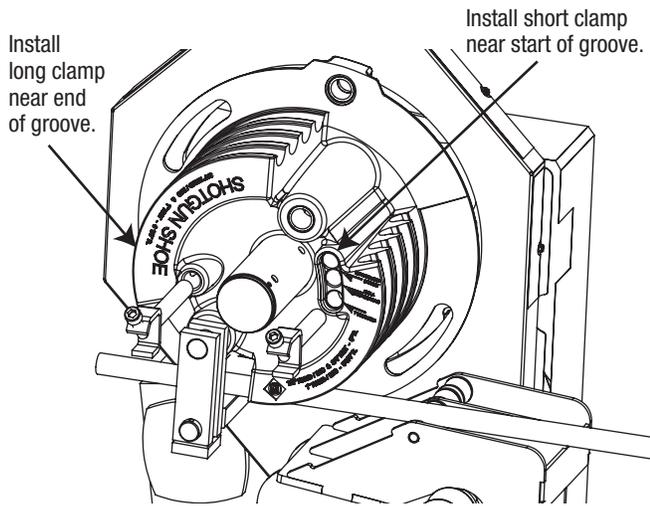


Operation (cont'd)

LENGTH INDICATOR

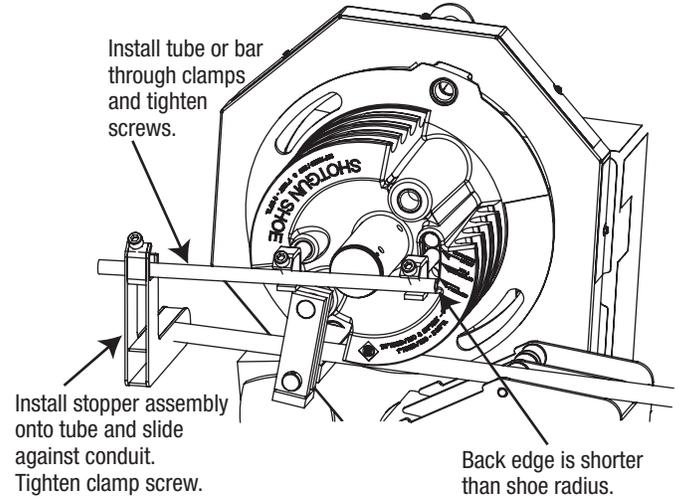
Use the length stop accessory for fast setup of identical bends on the shotgun shoe.

1. Load the conduit into the shoe so that the bending mark is aligned with the front of the hook.
2. Install the long clamp assembly into the proper mounting hole near the end of the shoe groove.
3. Install the short clamp assembly into the proper mounting hole near the start of the shoe groove, as shown.



4. Slide a piece of scrap conduit, square tube, or bar through the two clamps and tighten the clamp screws. Make sure the back of the conduit is shorter than the shoe radius.

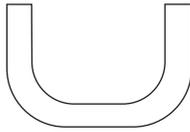
5. Slide the stopper assembly onto the tube or bar until the stopper contacts the conduit and tighten the clamp screw, as shown.



6. Install the additional length of conduit into the shoe until the ends contact the stopper assembly.
7. Press **BEND** to bend the conduit lengths to the desired angle.
8. Press **UNLOAD** to rotate the shoe backwards approximately 10° to remove the load on the hook.
9. Remove the hook and unload the conduit lengths.

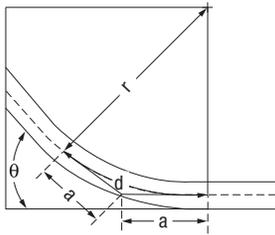


Illustrated Bending Glossary



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.



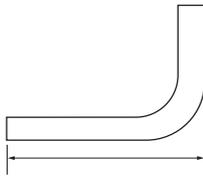
developed length — the actual length of pipe that will be bent; refer to distance “d” in the illustration at left.

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

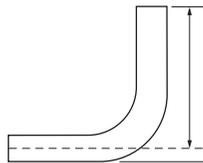
θ = angle of bend

r = the centerline bending radius of the bending shoe

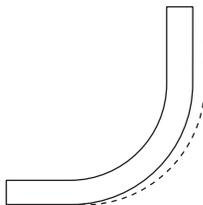
kick — single bend of less than 90°



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.



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.



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

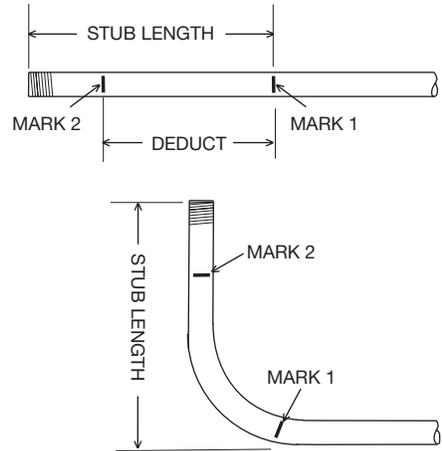


Bending Instructions

90° STUBS

1. Measure the length of the required stub.
2. Refer to 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.

*Note: When the operator presses **UNLOAD**, the conduit may spring back a few degrees. Compensate by over-bending as shown in the Scale Reading Tables.*



Deduct Table

CONDUIT SIZE		1/2	3/4	1
DEDUCT	RIGID/IMC	11	10-1/2	10
	EMT	-	10-3/4	10
MINIMUM STUB LENGTH = DEDUCT PLUS 2 INCHES				

Figures are approximate.

ANGLES FOR PENDANT TO ACHIEVE DESIRED BEND ANGLE															
CONDUIT SIZE	RIGID					EMT					IMC				
	15°	30°	45°	60°	90°	15°	30°	45°	60°	90°	15°	30°	45°	60°	90°
1/2	16	32	48	63	94	-	-	-	-	-	18	35	51	66	98
3/4	17	33	48	64	95	18	33	48	64	95	18	34	49	65	97
1	18	34	49	64	95	17	33	48	63	94	19	35	51	66	97

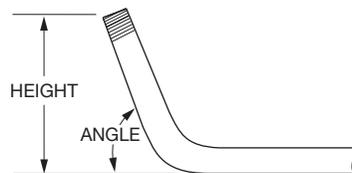
Figures are approximate.

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.





Additional Bending Tables

	DIM	ANGLE	2"	4"	6"	8"	10"	12"	15"	18"	24"	36"
3/4" EMT												
	Y	15	0.02	7.75	15.47	23.20	30.93	38.66	50.25	61.84	85.02	131.38
	Y	22.5		2.97	8.20	13.43	18.65	23.88	31.72	39.56	55.24	86.59
	Y	30		0.45	4.45	8.45	12.45	16.45	22.45	28.45	40.45	64.45
	Y	45			0.45	3.28	6.11	8.94	13.18	17.42	25.91	42.88
	Y	60				0.48	2.79	5.10	8.56	12.03	18.96	32.81
	Y	90						1.14	4.14	7.14	13.14	25.14

1" EMT												
	Y	15	1.45	9.17	16.90	24.63	32.36	40.08	51.67	63.26	86.45	132.81
	Y	22.5		4.46	9.69	14.92	20.14	25.37	33.21	41.05	56.73	88.09
	Y	30		1.92	5.92	9.92	13.92	17.92	23.92	29.92	41.92	65.92
	Y	45			1.81	4.64	7.47	10.29	14.54	18.78	27.26	44.24
	Y	60					3.97	6.28	9.74	13.21	20.14	33.99
	Y	90						1.79	4.79	7.79	13.79	25.79

1/2" IMC and Rigid												
	Y	15	0.05	7.78	15.51	23.23	30.96	38.69	50.28	61.87	85.05	131.42
	Y	22.5		2.96	8.18	13.41	18.63	23.86	31.70	39.54	55.22	86.58
	Y	30		0.41	4.41	8.41	12.41	16.41	22.41	28.41	40.41	64.41
	Y	45			0.38	3.21	6.04	8.87	13.11	17.35	25.84	42.81
	Y	60				0.40	2.71	5.02	8.49	11.95	18.88	32.74
	Y	90						1.06	4.06	7.06	13.06	25.06

3/4" IMC and Rigid												
	Y	15	1.29	9.02	16.74	24.47	32.20	39.93	51.52	63.11	86.29	132.65
	Y	22.5		4.24	9.46	14.69	19.92	25.14	32.98	40.82	56.50	87.86
	Y	30		1.66	5.66	9.66	13.66	17.66	23.66	29.66	41.66	65.66
	Y	45			1.51	4.34	7.17	10.00	14.24	18.48	26.97	43.94
	Y	60				1.35	3.66	5.97	9.44	12.90	19.83	33.68
	Y	90						1.48	4.48	7.48	13.48	25.48

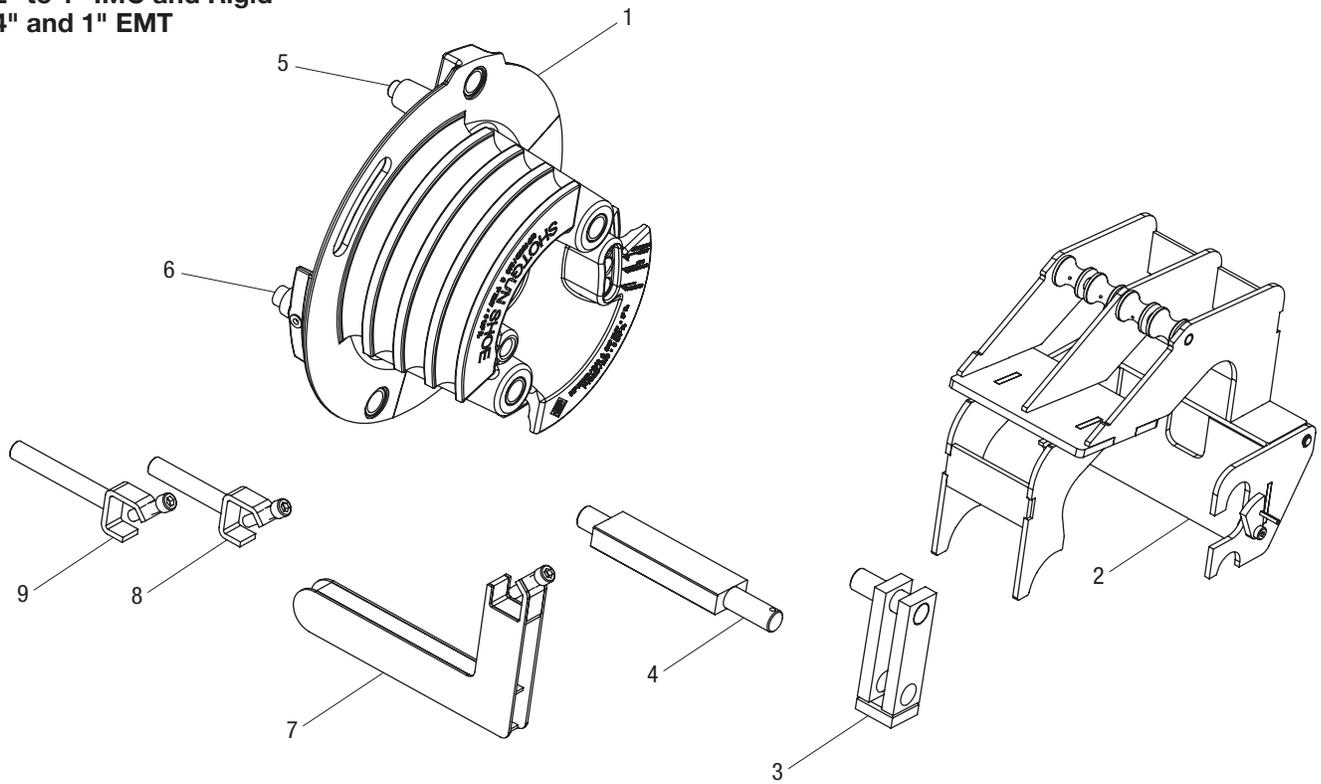
1" IMC and Rigid												
	Y	15	0.91	8.63	16.36	24.09	31.82	39.54	51.14	62.73	85.91	132.27
	Y	22.5		4.06	9.28	14.51	19.74	24.96	32.80	40.64	56.32	87.68
	Y	30		1.60	5.60	9.60	13.60	17.60	23.60	29.60	41.60	65.60
	Y	45			1.60	4.43	7.26	10.09	14.33	18.57	27.06	44.03
	Y	60				1.56	3.87	6.18	9.64	13.11	20.03	33.89
	Y	90						1.92	4.92	7.92	13.92	25.92



Illustration and Parts List

04034 SHOTGUN SHOE GROUP

1/2" to 1" IMC and Rigid
3/4" and 1" EMT



Key	Part No.	Description	Qty
1	52074609	Shotgun shoe assembly.....	1
2	52074610	Roller support	1
	52066771	Holding yoke assembly (includes 3 and 4)	1
3		Holding yoke weldment	1
4	52065462	Holding yoke plate kit	1
5	90524799	Drive pin	4
6	52055987	Shoe stud cap.....	1
	52074611	Length indicator kit (includes 7-9)	
7		Stopper assembly	1
8		Clamp assembly, short	1
9		Clamp assembly, long.....	1
	52075168	Decal kit, bend angle chart for 854DX (not shown)	
	52074612	Shotgun shoe adapter kit (not shown)	



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