

#### EEGOR BENDER COMPONENT CHART

Bender Frame	Adjustable Compression Roller Assembly	Pins	Cylinder	Bending Shoes	Follow Bar	U-Strap	Pump and Hoses	Set Size	ORDER EE MODEI							
	plates and assembly, U-strap pin	ludes double anchor ollers, frame pin roller	. 3	BZ-40 (4°)	BZ-40 (4") BZ-35 (3½") BZ-30 (3") BZ-25 (2½") BZ-26 (2½") BZ-26 (2½")	)   BZ-39 (3½°)   BZ-34 (3°)   BZ-28 (2½°)	EER-441 Pump (2) HC-9136 Hoses	21/2", 3", 31/2", 4" SETS	DeLuxe EEGOR Bender Set	B-445						
includes cylinder block.			8Z-74 Re anchor BZ-35 (3) Re pin BZ-25 (2)	BZ-35 (3½°)			Pump and Hose not included		DeLuxe EEGOR Attachment Set	B-446						
							EER 6422 Pump (2) HC-9136 Hoses		DeLuxe EEGDR Bonder Sel	B-448						
plates and		JDS-3014				EER-441 Pump (2) HC-9136 Hoses		Standard EEGOR Bender Set	B-444							
fractite privat assembly with clavis eye	add bettern plate	BZ-78		BZ 40 (4°) BZ-30 (3°)	) BZ-32 (3°)	BZ-32 (3°)	BZ-32 (3°)	BZ-32 (3°)	BZ-32 (31) BZ-34	BZ-32 (3°) BZ-34 (3°)	BZ-32 (3°)		Pump and Hose not Included	21/2", 3", 4" SETS	Standard EEGOR Atlachment Set	B-443
	assembly	assembly bend shoe pin	shoe pin   87-25 (2½")   BZ-26 (2½")   B	BZ-28 (2½*)	EER-6422 Pump (2) HC-9136 Hoses	L <u>.</u>	Standard EEGOR Bender Set	B-447								

Also available to bend 2" rigid and intermediate (I.M.C.) conduit (but NOT 2" EMT): BZ-20 2" Bending Shoe; BZ-22 -- 2" Follow Bar; BZ-24 -- 2" U-Strap.

#### UNPACKAGING

Remove all bender shoes, follow bars, U-straps and pins. Inspect for damage and compare these components to the complete set shown on page one for possible missing parts. Depending on which set you purchased the basic difference in component content will be whether you purchased a set having the 3½" size shoe, follow bar and U-strap included.

### MAINTENANCE OF YOUR EEGOR BENDER

Aside from conventional care of the hydraulic components, very little maintenance of the ENERPAC EEGOR bender is required. Removing sand and dirt from grooves and moving parts will extend bender life and facilitate ease of operation.

Lubricate rollers, when needed, with molybdenum disulfide paste only (such as Dow Corning's Molykote #G-n paste, or equivalent). For heavy use, LUBRICATE ROLLERS WEEKLY. Note: Graphite formulations are not equivalent lubrication.

### BENDER FRAME ASSEMBLY — REMOVAL, TRANSPORTING & STORAGE

To remove or carry the bender frame assembly — do so by placing hands on the bottom frame plate. You should have assistance so that the lifting points are at the front end and back end of bottom plate. CAUTION: Avoid pinched fingers by keeping hands clear of the BZ-72 Roller Assembly, which pivots freely on a pin through the cylinder rod eye and may swing suddenly aside during handling.

The hydraulic cylinder, cylinder mounting block and compression roller assembly slide back and forth between the two frame plates.

This sliding action is a function of the bender design for recycling the cylinder stroke to gain added reach of the cylinder rod to meet the need of your particular bend; up to a full 90 degree without the need of another set-up or repositioning the conduit.

The slide action permits the bender assembly to be collapsed to a shorter, compact length for handling and storage. Your bender frame assembly will be in the collapsed position within the storage case. When storing, be sure to remove your hydraulic hoses from the cylinder and secure dust caps on the coupler ports.

## ENERPAC.

### Instruction Sheet

/ EEGOR Hydraulic Benders B-400 Series

IMPORTANT: RECEIVING INSTRUCTIONS: Visually inspect all components for shipping damage. If any shipping damage is found, notify carrier at once.

Shipping damage is NOT covered by warranty. The carrier is responsible for all repair or replacement costs resulting from damage in shipment.

# SAFETY FIRST

**PRELIMINARY PROCEDURE:** Read all instructions carefully and completely before attempting to assemble or operate your hydraulic conduit bender. Most malfunctions in new equipment are the result of improper operation and/or assembly.

#### CAUTION: RESPECT THE POWER AT YOUR COMMAND!

Your EEGOR bender is a highly powered machine. At full rated pressure (9,250 PSI), the hydraulic cylinder will exert 30 tons of force; and even greater forces normally develop between the various bender components during operation. The operator must therefore understand and follow given instrumisapplication of these forces, with possib

during operation. The operator must therefore understand and follow given instructions to avoid misapplication of these forces, with possible parts breakage and hazardous consequences.

- STUDY AND UNDERSTAND THESE INSTRUCTIONS: You will save time and avoid damage by doing the job right
- FULLY ASSEMBLE ALL LOAD-BEARING PINS: Unless pins are properly seated, the first bending attempt could cause conduit or equipment damage.
  - The U-strap pin (BZ-76) must seat on its handle against 3½" and 4" U-straps and must seat on the pin shoulder against the smaller U-straps.
  - The top plate of the compression roller assembly must fully engage both lower roller axles.



 BZ-74 and BZ-78 pins must project through both upper and lower aluminum arms of the frame.



APPLY SQUEEZE TO E.M.T. (THINWALL) ONLY:
Check position of the cam knob before bending to ensure that it is always in position "C" except when bending thinwall. Applying squeeze to rigid steel conduit can break shoes.



● DO NOT ATTEMPT TO USE DAMAGED COMPONENTS: In the event that some bender component should become damaged, replace it. Continued use thereof could jeopardize other components and constitute a safety hazard as well.

#### CAUTION:

An EEGOR bender, properly used and in good repair, constitutes minimal risk in itself. Remember, you have 30 tons of force at work. Allow sufficient distance between bender and operator while engaged in actual bending of conduit.

● KEEP FINGERS CLEAR OF POSSIBLE PINCH POINTS:

Whether carrying the bender or during a bending operation, frame members moving over one another could severely pinch fingers or cut whatever got wedged in between. Also, do not lot fingers get between the pipe and follower bar when just starting to bend.



BEND ONLY CONDUIT THAT FITS FREELY INTO SHOE GROOVES: Oversize pipe that hangs up on the edges of the follower bar groove can sometimes split the follower bar.

If this:

Then this:  $\int$ 

**OUSE STANDARD PRECAUTIONS WITH HYDRAULIC HOSES** 

Couplings must be fully engaged to permit free flow of oil. Be alert to avoid developing sharp bends or pinching of hoses.



### **BENDER FRAME ASSEMBLY**

#### **PREPARATION**

- a. Place complete unit on a level surface. On the job site, it would be helpful to place this unit on a plywood or similar smooth surface.
- b. The frame plates have elongated slots or tracks which keep the movement of the cylinder in-line.

The bender has a pivot lock as shown to hold the top frame plate on the assembly when bending or transporting.

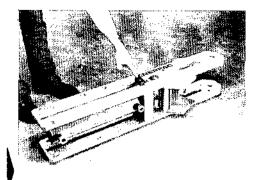


PHOTO #2

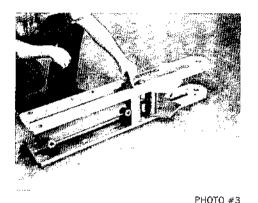
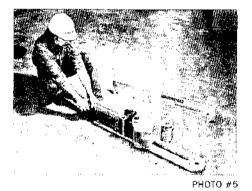


PHOTO #1

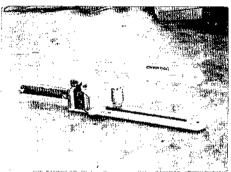
To prepare your bender for set-up, turn the lock so it is in-line with the frame slots and remove the top frame plate.



PHOTO #4



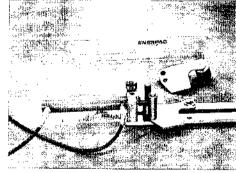
Grasp hydraulic cylinder and place your foot against the bottom frame as shown, and pull assembly back until the cylinder block holes are aligned with the proper set of holes on the bottom plate. (See "Installation of Bending Shoes" section below.) Reverse this procedure for storage.



PHO10 #6



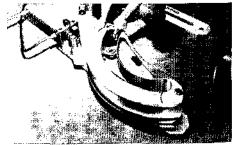
Lift and remove the adjustable compression roller assembly. Connect your hydraulic hoses to the pump valves first and then hook up your hoses with the coupler end to the hydraulic cylinder ports. Be certain the couplers are fully engaged and then thread the coupler sleeve fully to the hose end of the coupler. (Note: Failure to engage couplers fully could result in trapping the oil in one end of the cylinder and cause serious overpressuring of the cylinder and possible harm to the operator.) You are now ready to install the desired shoe size.



PHO10 #8

### INSTALLATION OF BENDING SHOES

The bending shoe is next placed on the bottom frame plate, but the size shoe selected determines the best starting position of the **cylinder mounting block** on the bottom frame plate. How this starting position affects ease of operation and the amount of cylinder recycling required to reach the desired degree of bend will soon become apparent when the bending operation progresses. It is sufficient to just position the holes in the cylinder mounting block in alignment with the first set of frame holes when installing the 4'' and 31/2'' shoes, the second set of frame holes when installing the 21/2'' shoe.



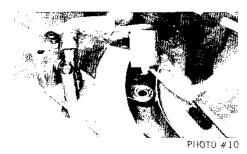
Locate the cylinder mounting block holes to line up over the first set of bottom frame plate holes — then position the shoe as shown over the bottom roller plate. The shoe top side is the side with the angle reading marks on the shoe lip. Center the roller plate hole in between the shoe slot.



PHOT0 #11

### MOUNTING THE 4" OR 31/2" SHOES

(See page 5 for mounting the 21/2" and 3" size shoes.)



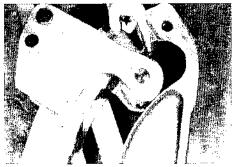
Place the compression roller assembly in the shoe opening as shown. One end of the roller assembly plate fits over the first roller pin. Note: On the bottom of the compression roller you will notice two flat sides on the

pin. These must be lined up to the matched flats in the bottom female hole of the roller plate hole now under the shoe slot.



After placing the compression roller assembly in position you will notice in most cases that the roller plate is not fully down and flush with the second roller pin as shown. This is caused by failure to align the roller pin flats with the bottom female roller plate hole-flats. To get the top roller plate hole flush on the pin — simply move the compression cam-knob back and forth slightly to seat properly as shown in photos #11 and #12. Prior to any bending the pin top should always be flush as shown in photo #12.

**EMT OR RIGID** BENDING — SEATING THE ROLLER ASSEMBLY



A. When the cam-knob is in the upper position (photo #13) marked "T", the carn within the roller is set for additional squeeze on the conduit - and needed for EMT thinwall conduit. CAUTION: Do not attempt to bend anything except EMT thinwall with the camin this position because excessive stress would be applied to both the pipe and the bender.



PHOTO #15

### EMT/RIGID BENDING CAM POSITION

On any given shoe size — you first position the cam-knob to either the "T" (Thinwall) or "C" (Rigid & IMC Conduit) position -depending on what you are to bend. (Note: To move the cam-knob to either position, first lift the top roller plate with compression roller assembly so flats are not engaged with the bottom hole flats. Cam adjustment cannot be made when the top roller plate is flush with the second pin.)

B. When the cam knob is switched to the lower position marked "C" (photo #14), the squeeze adjustment is reduced. Be sure to raise the roller plate assembly slightly when switching. This position is used for all steel and aluminum rigid conduit plus Intermediate Metal Conduit (IMC).



Switch-on the pump motor and press the push-button marked "Pressure" located on the hand held switch. This will advance both the cylinder rod and the bend shoe forward so that you can align the front shoe pivot hole with the bottom plate hole as shown in photos #15 and #16. You may also have to swing the shoe slightly with your free hand to line up. (Note: This sequence was for the 3½ and 4" shoe sizes.)



PHQT0 #14

Once cam knob is set for the desired conduit reseat the cam flats on the roller by slightly moving the cam knob back and forth until the top roller plate hole is again flush with the top of the roller pin as shown in photo #12.



PHOTO #16

### SHOE MOUNTING FOR SMALLER 21/2" - 3" SIZE SHOES

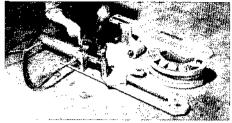


PHOTO #17

The procedure is very similar to instructions on page 3, except the cylinder mounting block is first positioned over the middle set of frame plate holes so these holes are aligned — see photo #17. The purpose of this is to compensate for the smaller shoe size within the frame so the cylinders standard reach or stroke is sufficient to complete a full 90 degree bend.

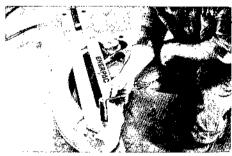


PHOTO #20

Place top frame plate on shoe and cylinder block, align holes, and insert shoe lock pin all the way through top plate, shoe and bottom frame plate.

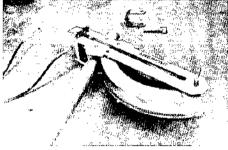


PHOTO #23

Load conduit as shown between groove of shoe and rollers

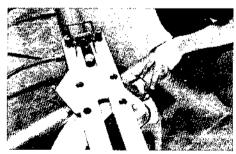


PHOTO #26

After pin is inserted — be certain it is all the way down and through or flush with the bottom edge of strap. Collapse movable handle in forward position pointing away from the shoe — should you retract shoe further, the pin and handle will then clear the frame.

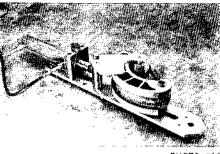


PHOTO #18

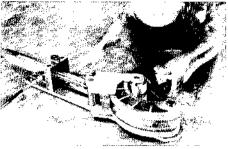


PHOTO #19

Same as Photos #13, #14, #15, and #16 for setting cam and moving the cylinder plunger and shoe forward to align the front shoe pivot holes. The only difference is moving the cylinder block location. For the  $2\frac{1}{2}$  shoe size — move the cylinder block to the last set of frame holes.



PHOTO #21

Turn pivot lock so that it is crosswise to the frame slot to lock the frame.

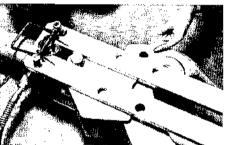
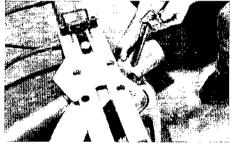


PHOTO #24

PHOTO #2:

Insert double anchor pin as shown—inserts through top frame plate, cylinder mounting block and bottom frame plate. Horizontal bottom member of handle should rest on top of pivot lock. Apply foot pressure if needed.



**PHOTO #25** 

The leading edge of bend shoe has a hole for locking on the corresponding size U-strap. (See photo #24.) After conduit insertion — clamp correct size U-strap around conduit and align the holes for inserting the U-strap lock pin. When aligning these holes it may be necessary to retract cylinder and bending shoe slightly so the holes are close to the top roller plate. Repositioning the long end of the conduit at the same time will also assist in line up. Note: If a tight bite is needed where the conduit threads are close to the strap edge — thread on a coupling first to protect the threads.

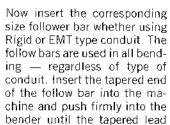


PHOTO #27

edge butts firmly against the side of the U-strap. You are now ready to begin the bending cycle. On EMT, support other end of conduit so conduit is parallel to ground, using one of your follower bars.

### **BENDING OPERATION**

the appropriate angle indicator pointer on the bending shoe — your desired bend angle

has been reached.

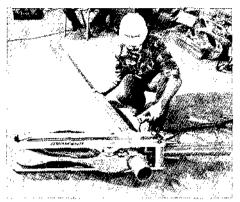


PHOTO #28

- A. Being careful not to place your fingers inside the follow bar groove facing the conduit hold follow bar firmly near end as shown.
- B. **Before** actuating the pressure button on the hand switch push end of follow bar firmly against the conduit and also apply a **forward** pressure so the follow bar presses against the U-strap. This is to prevent the tapered end of the follow bar from slipping back a few inches when the pressure button is actuated and the bend shoe begins to turn. A few tries will demonstrate this.
- C. Actuate pressure button and hold follow bar firmly against the U-strap. The bend shoe will start to turn and draw in the follow bar. Once the follow bar moves by itself—release hand pressure on follow bar.

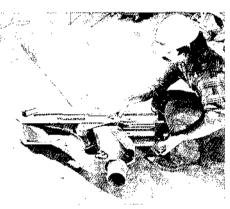
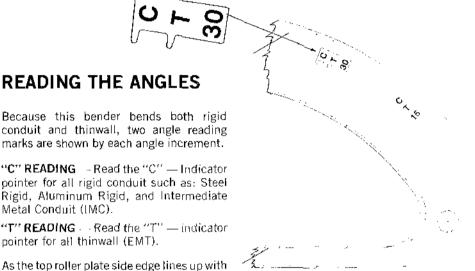


PHOTO #29

Proceed to bend reading desired angle on lip of bend shoe at the straight edged side of top roller plate as shown.



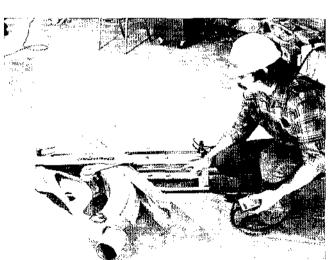


PHOTO #30

If your desired bend angle is beyond the reach of the cylinder stroke as shown — continue to bend until the full stroke or reach of the cylinder is attained. When you have reached this point the cylinder rod and bending shoe will stop moving. When movement stops — release pressure button on handswitch immediately.

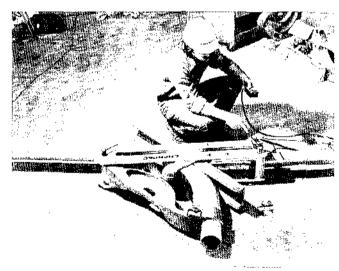
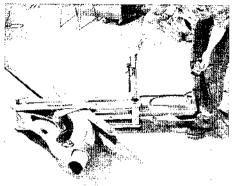


PHOTO #31

You now want to move the cylinder mounting block to the middle set of frame holes. To do this — press the "Return" push button to take the pressure off the double anchor pins. You may find that jogging the buttons by pressing the Return or Pressure buttons slightly will help if the pin seems to stick when pulling up.

### BENDING OPERATION, CONTINUED





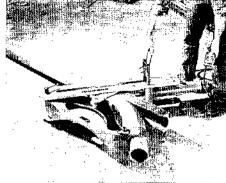


PHOTO #33

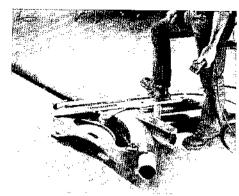
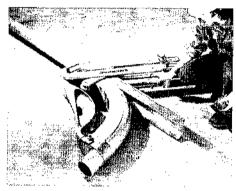


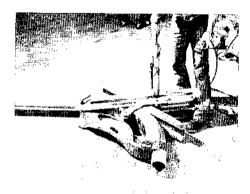
PHOTO #34

As you press the return button momentarily — pull up on the double anchor pin handle at the same time till it lifts out of the holes. When the double anchor pin is pulled it will permit the cylinder and frame to slide freely when the hand push-button is pressed.

Now continue to push the return button for movement until the cylinder block holes line up with the middle set of frame plate holes. If not lined up properly you will not be able to freely drop in the double anchor pin. You may have to inch the movement by momentarily touching the pressure or return button to line up. Once the double anchor pin is inserted — apply a slight foot pressure to be certain the double pin is fully down.







**РНОТО #36** 

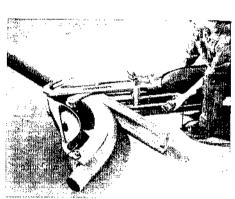


PHOTO #37

Proceed again to bend until desired angle is reached. If your bend angle is again more than the cylinder reach -follow the same procedure as steps 30 through 34 to align the cylinder block holes with the final or last set of frame plate holes.

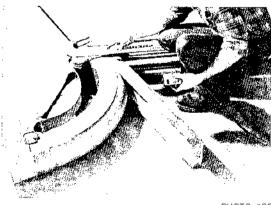
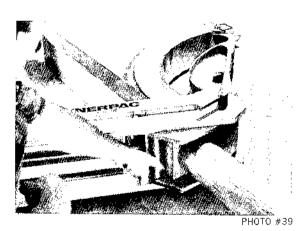


PHOTO #38

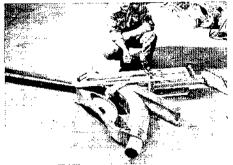


Proceed to bend until desired angle is reached or until you obtain a full 90 degree bend — reading it on the shoe as the desired angle aligns with the roller plate edge. To check for springback - just touch the release button for a fraction of a second, which will relieve pressure on the conduit. If under 90 degree hit the pressure button again and go slightly beyond the 90 degree mark. Again release pressure and check for spring back.

At a full 90 degree angle your follow bar should have about 1½" to 2" of bar showing by the roller. Should you ever drive follow bar beyond the roller it will become out of phase with the bend shoe when retracting. To correct this, see "Follow Bar Synchronization and Removal" on page 8.

### STRIPPING OUT THE CONDUIT

This bender automatically strips the conduit for you.

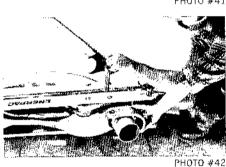


- A. After your bend cycle simply push the return button until the cylinder rod is fully retracted.
- B. Then jog your buttons to release the pressure on the double anchor pin and pull this pin out completely. (Note: If your bend angle was such that you never moved the double anchor pins for added cylinder reach -- step #B is not followed -- simply pull the follow bar from the machine as the cylinder retracts.)

PHOTO #40



- C. (Photo #41) With the pin out push the "pressure" button to align the cylinder block holes with the starting holes or the first set and insert the double anchor pins to lock. Figure #41. Again retract the bender and cylinder rod.
- D. When the follow bar is almost out assist it by pulling on it as it nears the tapered end to clear the machine.





E. With the bar now clear and the U-strap close to the frame — pull U-strap pin and remove U-strap. Your conduit is now stripped from the shoe — simply remove it for installation.

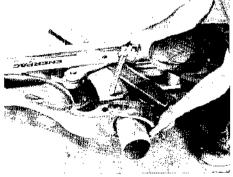
FOLLOW BAR SYNCHRONIZATION — REMOVAL



PHOTO #44

Occasionally your follow bar may become out of synchronization with the movement of the bend shoe on the return — stripping out cycle.

If this happens — care should be taken by visual inspection as you are retracting the cylinder. Photo #44 illustrates what to look for in an out of phase condition. You will note the follow bar slipped forward over the strap — rather than the front end of follow bar remaining behind the strap.



PROCEDURE FOR REMOVAL

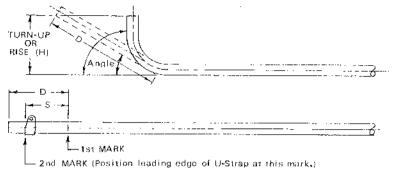
PHOTO #45



PHOTO #46

- A. After the desired bend retract the bend shoe until the strap is **close** to the follow bar as shown in fig. #44. Do not retract further or make contact with the U-strap against the follow bar or breakage could occur.
- B. Photo #45 Once close to the follow bar simply remove the U-strap first by putting the pin.
- C. Photo #46 Then assist follow bar out by retracting the bend shoe further while pulling out the follow bar with your free hand.

### 90° STUB-UP AND KICK BEND INSTRUCTIONS FOR ENERPAC EEGOR BENDER



### TO MAKE EITHER A STUB-UP OR KICK BEND:

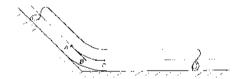
- 1. Determine "H" dimension by measuring rise or height needed. From "Diagonal Distance Chart" at right, determine straight length of pipe (D) needed to reach to desired turn-up height (H) at desired bend angle.
- 2. Lay off this distance (D) from end of conduit, and make first mark.
- 3. From "Set-Back Chart", select proper set-back dimension (S) corresponding to conduit size and bend angle desired.
- 4. Measure distance (S) back from first mark, and make second mark (see figure above).
- 5. Place conduit in EEGOR bender with second mark aligned with leading edge of U-Strap (see figure above), and bend conduit to desired angle.

DIAGONAL DISTANCE (D) CHART						
RISE		BEND ANGLE				
(H)	15⁰	30°	45°	60°	$90^{o}$	
2	7%	4	2 13/13	2 %	2	
4	15 %	8	5 11/6	4 %	4	
6	23 %	12	8 1/2	6 157	6	
8	30 1%	16	11 🖔	914	8	
10	38%	20	14 1/6	11 %	10	
12	46 ⅓	24	17	13 /s	12	
14	54 1/46	28	19 1%	16 %	14	
16	61 1%	32	22 %	18 3/2	16	
18	69%	36	25 % 6	20 %	18	
20	77 ¼	40	28 %	23 %	2.0	
22	85	44	31 %	25 %	22	
24	92 ¾	48	33 1%	27 🚟	24	
26	100%。	52	36 %	30	26	
28	108 %	56	39%	32 %	28	
30	115 1%	60	42 1/14	34 %	30	

#### SET-BACK CHART

"S" Set-Back Dimension (inches)					
Stub-Ups		ND\$			
90°	60°	45 <sup>n</sup>	30°	15 <sup>u</sup>	
15%	9 🖫	6	348	1 5	
1834	11	71/4	4	1 %	
24	13 %	81/4	4 %	1 %	
28	16 ¼	10%	5%	1 %	
	Stub-Ups 90° 15% 1834 24	Stub-Ups           90°         60°           15 %         9 %           18 %         11           24         13 %	Stub-Ups         KICK BE           90°         60°         45°           15%         9%         6           18%         11         7%           24         13%         8%	Stub-Ups         KICK BENDS           90°         60°         45°         30°           15%         9%         6         3%           18%         11         7%         4           24         13%         8%         4%	

#### OTHER USEFUL BENDING DATA FOR ENERPAC EEGOR BENDERS:



#### Developed Length of Bend:

When conduit is bent, the length along the bend at the neutral axis (i.e., approximately the centerline of the pipe) is commonly called "developed length" of the bend.

#### Gain of Bend:

The difference between the "squared off" distance (AB + BC) around a corner and the "developed length" (AC) along a bend is commonly called "gain" of the bend. (Measurements should be made at the pipe centerline).

#### "DEVELOPED LENGTH" OF BENDS CHART

Nominal Conduit	"DEV	/ELOPED	LENGTH" (inches)	OF BEN	NDS
Size	90°	60°	45°	30°	15°
2 1/2	16 ¾	10 1%	8%	5 1/16	2.34
3	201/4	13 1/2	10 %	6%	3 3 <sub>18</sub>
3 1/2	24 1/16	18%	1334	91/8	4 %
4	31 %	20 15/4 8	151%	$10\%_6$	5 %

#### "GAIN" OF BENDS CHART

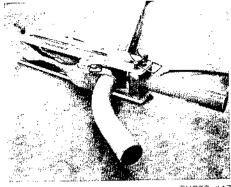
Nominal Conduit	"GAIN" OF BENDS Measured at Centerline (inches)					
Size	90°	60°	45°	30°	15°	
2 ½	5 %	1 1/2	3/4	57 71.6	1 78	
3	5 % 6 %	1 %	<b>1</b> / <sub>8</sub>	⅓,	1/6	
3 1/2	8名。	2 7/6	1 ½	1/2	V <sub>8</sub>	
4	911/16	2 34	1 %	9/ /16	3/ -10	

### OFFSET BEND INSTRUCTIONS FOR ENERPAC EEGOR BENDER

### BENDING OFFSETS

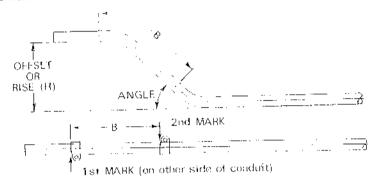
You'll find offset bending is easy with the added benefit of bending good close offsets.

- A.) Photo #47 To bend your offsets proceed to bend in the normal manner covered above until you have the desired bend.
- B.) Retract and strip out conduit. Rotate your conduit and locate as shown for the second bend. Photo #48 - Complete your second bend, retract and strip out conduit for a good offset bend.





When making offset bends, caution should be taken not to attempt too tight an offset. You will see the follow bar lift off the conduit when you start your second bend if it is too tight. Stop bending immediately or damage could occur to the bender. Correction is achieved by shifting the conduit so the U-Strap engages the conduit more closely to the unbent portion of the conduit. See Photo #47.



#### TO MAKE AN OFFSET BEND:

- 1. Make first mark at location determined either by edge of obstacle, or by following "Kick Bend Instructions for ENERPAC Eegor Benders" - (page 9).
- 2. From the "Offset Chart" for the size conduit to be bent, obtain measurement (B) for offset height (H) and bond angle desired.
- 3. Make second mark at distance (B) beyond first mark, and on opposite side of conduit, as illustrated above.
- Place conduit in EEGOR bender with first mark aligned with leading edge of U-Strap (see figure above), and make first bend to the desired angle.
- 5. Advance the bent conduit thru the frame assembly of the EEGOR bender. and rotate the conduit 180°, so the second mark now aligns with the leading edge of the U-Strap.
- Complete offset by making second bend to the exact same angle as the first bend.

60°

16 %

18 1%

21 1/4

23 1/2

28 %

30 %

32 %

25 1%

Desired Offset

2

6

Я

10

12

14

16

18

20

22

24

26

28

30

21/4 " CONDUIT OFFSET CHART

Desired MEASUREMENT (B)							
Desired Offset	(inches)						
(H) (inches)	15°	30°	45°	60°			
2	7 %		_	. –			
4	15 1/4	_	-	_			
6	23 %	11 'ሂል	• • •				
8	30 %。	15 1/46	_	-			
10	38 1/2	1911/16	13 % 6				
12	46 ¼	23 1/16	161/4	_			
14	54	27 1/16	19%	14 %			
16	61 1%	31 1/4 6	21 1/8	16 1%			
18	69 %。	35 1%。	24 ¾	191/4			
20	77 %。	39 1%。	27 %	21 %,			
22	84 %	43 1%	30 ¾	23 %			
24	925,	47 1%	33 %	26 %			
26	100 %	51 1%,	36 1/4	28 1/2			
28	108 %	55 1/4	38 ⅓	30 1%			
30	115 ' ችሬ	59 1 % s	41 1/4,6	33 %			

#### 3" CONDUIT OFFSET CHART

30°

11 %

15 %

19%

23 %

27%

31 %

35%

39 %

43 %

47 %

51 %

55%

59 %

Desired Offset

2

4

6

8

10

12

14

16

18

20

22

24

26

28

30

15°

7%

15 %

23 1/4

30 34

38 1/2

46 14

53 1%。

61 1%,

69 %

77 1/8

84 %

92 %

100 % 108 %

115 %

(H) (inche

MEASUREMENT (B)

(inches)

45°

131/4

16 %

18%

21 %

24 %

27 %

30 %

33 %

35 %

38 1%

41 1/2

31/2" CONDUIT OFFSET CHART

MEASUREMENT (B) (inches)						
15°	15° 30° 45° 60°					
7%	_		_			
15 %	4					
23	_	_	_			
30 %	151/2	-				
38 1/2	191/4	-	-			
46 %	23 1/2					
53 1/44	27 1/2	18 %				
61 1% <sub>6</sub>	31 1/2	21 1/9	-			
69 %	35 1/2	24 %				
77 %	39 1/2	27 %	-			
84 %	43 %	29 1 1/46	-			
92 $\%_o$	47 1/2	32 1%,	25 ¼			
100%。	51 ½	35 %	27 %			
108	55 1/2	38 %	29 %			
115 ¾	591/2	41 1/4	32 %			

4" CONDUIT OFFSET CHART

Desired Offset	MEASUREMENT (B) (inches)					
(H) [inches]	15°	30°	45°	60°		
4	15 ¼₀					
6	23	'				
8	30 %		_	-		
10	38 %。	19 1/4	_	. :		
12	46 % a	23 1/18				
14	53 1 %	27 1/4	_			
16	61 1/4	31 %	21 1/4 .	-		
18	69 %	35 %	24 %	_		
20	77 1/4	39 %	27			
22	84 1%。	43 %	29 ¼,	_		
24	92 %	47 %	32 %	24 1%		
26	100%。	51 %	35 %	27 !я		
28	108	55 %	38 1/4	29 %		
30	115 %	59 %	41 %	31 %		