Conduit Bending Lab 2

Program: Electrician Technician

Course: EL130 Flexible Cables/Conduit Bending and Raceways

Objectives: Under the supervision of your instructor, you should be able to do the following:

- Make a 4 – point saddle in a length of conduit to cross over 4" X 4" block with less than 1" clearance between the block and the conduit.

Lab Equipment:

- N/A

Required Tools:

- 1 – ½" pipe bender
- 1 – Tape measure

Materials:

- 1 – Pencil
- 1 – 4" X 4" Item (4S metal box, block, etc.)
- 2 – 4/s metal boxes without brackets
- 2 – ½" EMT set screw connectors
- 5' – ½" EMT pipe

Safety (PPE):

- Safety glasses/goggles
- Hard Hat

Resources:

- Ugly' s Electrical References Book

Required Time: 1 Day

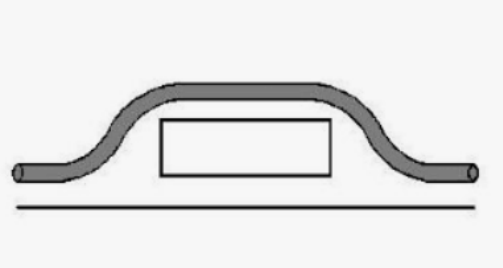
Shop Maintenance:

- All work will cease 20 minutes prior to the end of class.
- All work areas must be cleaned.
- Tools and equipment must be cleaned and returned to the designated areas (cage, tool room, cabinets etc.)
- Any broken or missing tools must be reported immediately.
- Tools and equipment are students' responsibility

Procedures: (Eye protection must always be worn)

For this exercise, all the bending will be done with the bender upside-down with a boot on the end of the bender. The instructor must always be present.

Steps to bending a 4 – point bend going over an object that is 4" tall



1. For beginner purposes we are going to use 30° bends, any standard ½" EMT bending chart will give you the degrees you bend based off the height you need to clear.
2. Measure the height of the block (4") and multiply it by two, based off the chart for 30° bends.
3. Measure and mark the distance (20") from the box to the 4" block.
4. Subtract the offset total (8") from the first mark on the pipe going towards the box and make your second mark.
5. Measure the length of the obstruction (4") and add that to the first mark, going away from the box, making your third mark.
6. Add the total length of the offset (8") and add it to the third mark and then make your fourth mark there. You should now have four marks on the pipe in order from the beginning of the box at 12", 20", 24" and 32".

7. Insert the pipe into the bender and align the first mark made (20”) on the conduit with the arrow on the bender. Make sure that the shoe is pointed towards the center of the bends (toward object). Slowly bend the conduit until it lines up with the hash mark on the bender at 30°. Figure 1 Note: must be parallel with the line and not meeting the line.
8. Rotate the conduit 180° exactly and then slide the conduit back until the second mark (12”) lines up with the arrow. Making sure the conduit is still at 180°, slowly make a bend until it lines up parallel with the 30° line.
9. Turn the pipe around and slide into the bender, so the previously bent portion of the pipe goes down, until you reach the third mark. With the “hook” of the bender pointed toward the center of the bends, slowly make a 30° bend.
10. Slide the pipe to the fourth mark and rotate the pipe 180° bend the last 30° to complete the 4-point saddle.
11. Bend in the box offsets and secure pipe into the boxes.

Figure 1 - 30-Degree Offsets to Clear Masonry Blocks