

# Low Voltage Electrical Installation

## MODULE 3

### Chapter 2: Configuration, Tools, Equipment and Accessories

by

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# Module Description

- **Expected Outcomes**

- Construct electrical wiring using suitable wiring tools and accessories.
- Apply ethical principles and commit to professional ethics.

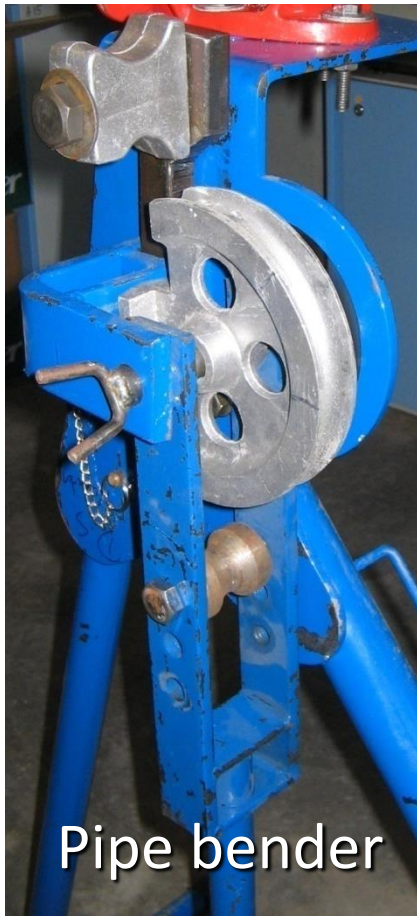
# Configuration of Tools

- **Module Outline**
  - Pipe bender + vices
  - Stock & die
  - Metal cutter
  - Cable stripper/cutter
  - Hand drill
  - Hand hacksaws
  - Pipe wrenche
  - Steel square
  - Bending spring
  - Wire/cable puller



# Configuration of Tools (cont.)

- Pipe bender + vices



# Configuration of Tools (cont.)

- Pipe bender + vices
- Function: to bend a Galvanized Iron (G. I.) conduit
- How to use:
  - Draw a line as mark on a conduit for required angle of bending (e.g.  $45^{\circ}$ ,  $90^{\circ}$ ).
  - Put the conduit through the provided path on the bender.
  - Push the handle downward to the ground until you get the required angle of bending.



# Configuration of Tools (cont.)

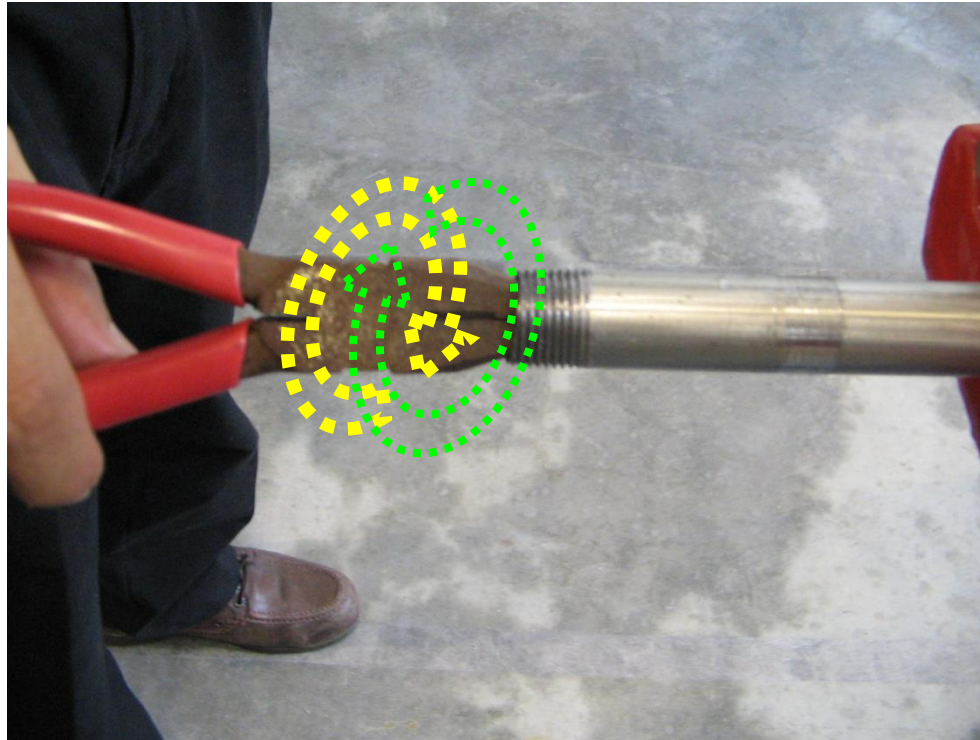
- **Stock & Die**



# Configuration of Tools (cont.)

- Stock & Die
- Function: to thread a G.I. conduit
- How to use:
  - Loosen the “die” part together with “stock” part by rotating the main gear.
  - Insert the conduit into die head.
  - Tighten the die head by rotating the main gear at different direction to ensure the conduit is gripped enough.
  - Start to thread a G.I. conduit by rotating the “stock & die” handle in clockwise direction.

# Configuration of Tools (cont.)



**\* Use a file or spanner to scrape off the sharp-end of the conduit so it will not sharp and dangerous**



# Configuration of Tools (cont.)

- **Metal cutter**



# Configuration of Tools (cont.)

- Metal cutter
- Function: to cut a metal including metal trunking
- How to use:
  - Draw a line as mark on the surface of the metal that needs to be cut.
  - Cut the metal (trunking) by following the drawn mark carefully.

**Wear a pair of safety gloves in doing this job !!!**

# Configuration of Tools (cont.)

- Cable stripper/ cutter



Source: [1]

# Configuration of Tools (cont.)

- Cable stripper/cutter
- Function: to strip/cut a cable/wire
- How to use:
  - Similar to normal cutter (for cutting)
  - For stripping:
    - Open the “mouth” of the stripper.
    - Put the cable/wire through the opening.
    - Close the “mouth” and strip the cable by moving it roundly in closed “mouth” slightly until the exterior PVC insulator is removed.



# Configuration of Tools (cont.)

- Hand drill



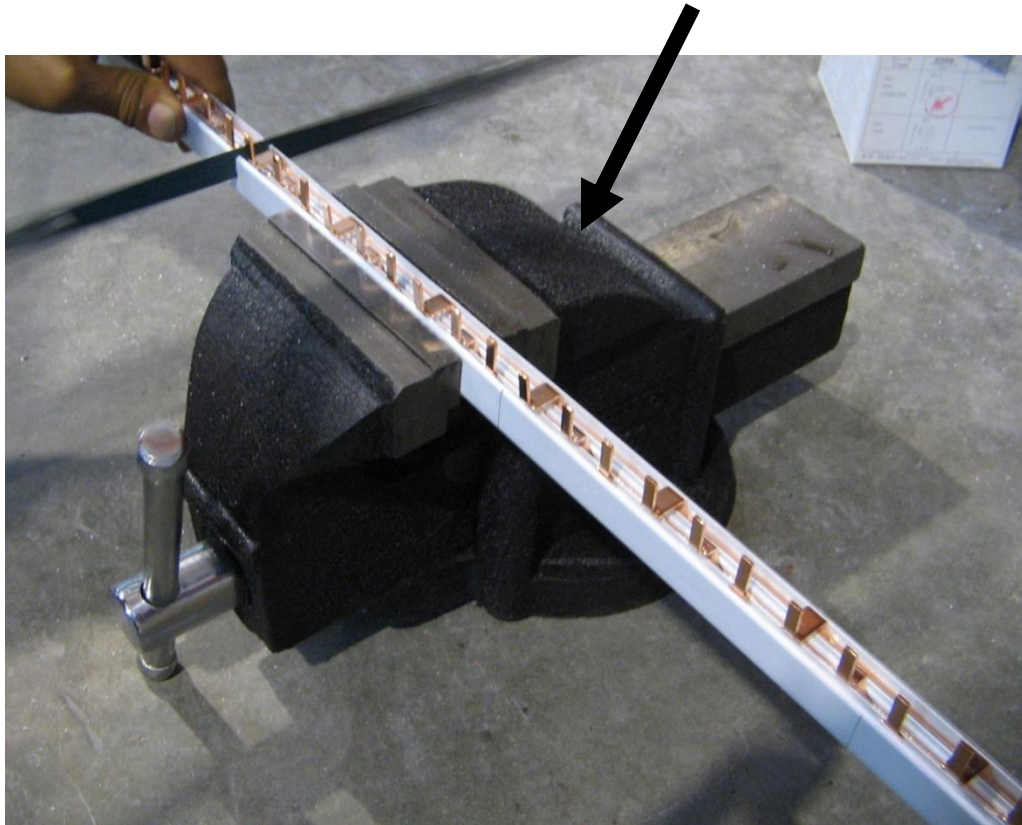
# Configuration of Tools (cont.)

- Hand drill
- Function: for screwing-in OR screwing-out
- How to use: (screwing-in)
  - Put the screw at the drill tip (magnetic) if the screw is located outside the hole.
  - Hold the drill carefully and place it onto the wanted place.
  - Pull the switch (hand-switch) until the screw was tighten
- \* Use the opposite direction of direction-switch for screwing-out

**Use hand drill for hard-drilling only!!!**

# Configuration of Tools (cont.)

- Bench vices 4"



# Configuration of Tools (cont.)

- Bench vices 4”
- Function: to grip and hold an object
- How to use:
  - Open the “vice mouth” by rotating the handle anticlockwise.
  - Put the object between the “lips”.
  - Close the “vice mouth” by rotating the handle in clockwise direction.



# Configuration of Tools (cont.)

- **Hand hacksaws**



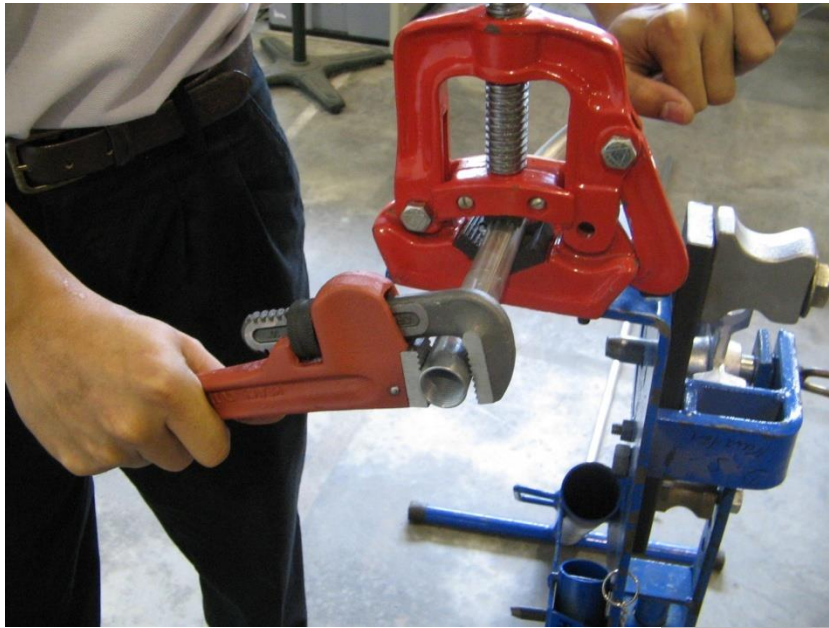
# Configuration of Tools (cont.)

- Hand hacksaws
- Function: to cut a conduit/trunking
- How to use:
  - (Similar to normal saws)
  - Place the G.I. conduit into the vice.
  - Put the blade of the hacksaw on the marked line.
  - Start to cut the conduit by moving it with necessary force until the target is achieved.

**Hacksaw is a better cutter for conduit than trunking!!**

# Configuration of Tools (cont.)

- **Pipe wrench**



# Configuration of Tools (cont.)

- Pipe wrench
- Function: to grip and hold a conduit
- How to use:
  - Open the “mouth” of the pipe wrench
  - Insert the conduit and make sure it is properly gripped.



# Configuration of Tools (cont.)

- **Adjustable steel squares (10 cm/4")**



## Configuration of Tools (cont.)

- Adjustable steel squares (10 cm/4")
- Function: to make a mark of line on a trunking (e.g.  $90^\circ$  or  $45^\circ$  )
- How to use ( $90^\circ$ ):
  - Put it on any  $90^\circ$  equipment/tool to get the  $90^\circ$
  - Put the steel square onto a trunking
  - Make a line by following it's line using pencil or

# Configuration of Tools (cont.)

- **Bending Spring**



Source: [2]

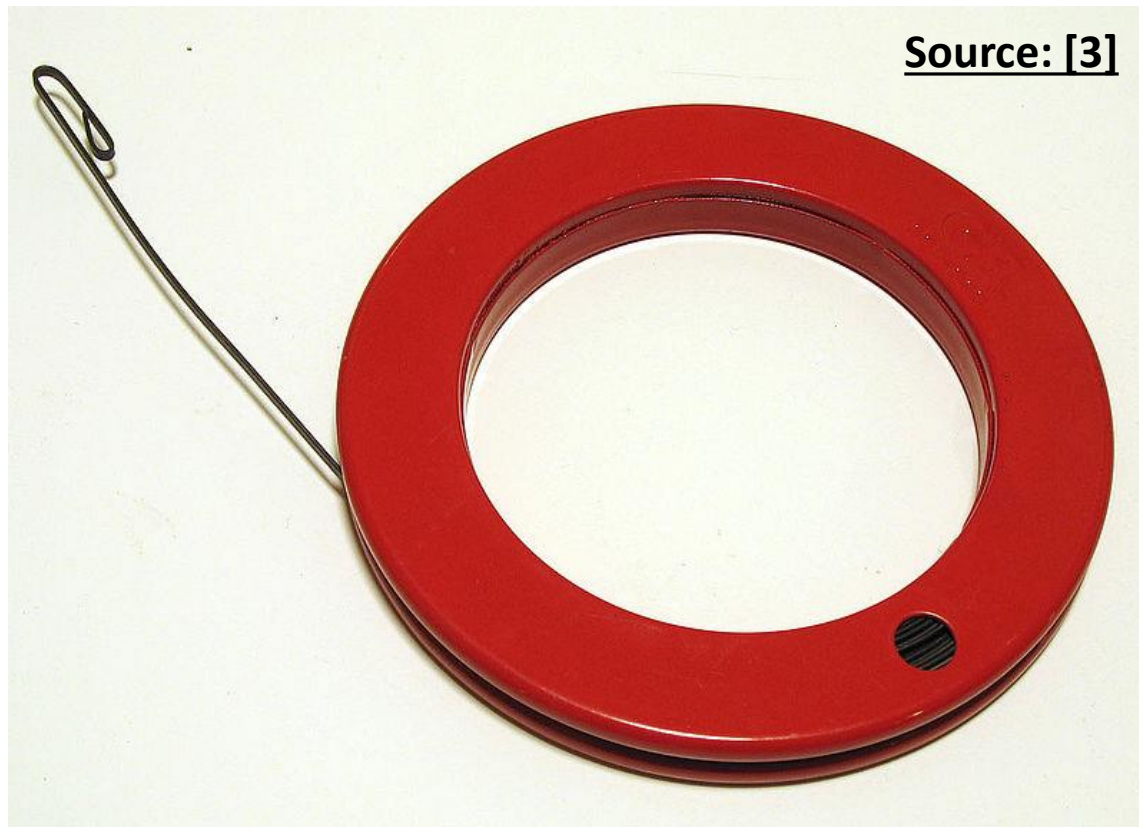
# Configuration of Tools (cont.)

- Bending spring
- Function: to bend a PVC conduit
- How to use:
  - Insert the spring into the PVC conduit/pipe
  - Hold the conduit on both edges of the spring and place it under the knee
  - Bend the conduit slowly until you get the shape that you want (e.g. 90° or 45° )



# Configuration of Tools (cont.)

- **Wire/cable puller**



Source: [3]

## Configuration of Tools (cont.)

- Wire/Cable puller (fish tape)
- Function: to pull wire/cable through the conduit from one side to another side
- How to use:
  - Attach and tighten the cable(s) to the puller with the PVC tape, properly.
  - Insert the edge of the puller into the conduit and push it gradually until it comes out from the other side of the conduit.

# References

- [1] Flickr, <https://www.flickr.com/photos/oskay/4793150782>, 2010.
- [2] Wammes Waggel, A bending spring for a PVC pipe, <https://commons.wikimedia.org/wiki/File:Buigveer1.jpg>, 2012.
- [3] Lucius Kwok, Electrical fish tape reel 50 feet, [https://commons.wikimedia.org/wiki/File:Fish\\_tape.jpg](https://commons.wikimedia.org/wiki/File:Fish_tape.jpg), 2008.

# Thank you

