EL140 4 Way Switch Lab

4-Way Switch Lab

Program: Electrician Technician

Course: EL140

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

- Wire a 4-way switch between two 3-way switches

Lab Equipment:

- Residential Bays or project board

Required Tools:

- 1 – Hammer
- 1 – Flat head Screwdriver
- 1 – Pair of Strippers
- 1 – Set of diagonal cutters
- 1 – Utility knife

Materials:

- 1 – Cord (project board)
- 4 – 4S metal boxes (project board)
- 1 – Sub panel (bay)
- 3 – Single gang plastic side nail boxes (Bay)
- 1 – Plastic side nail 4/0 box
- 15’ – 14/2 Romex
- 15’ – 14/3 Romex
- 5 – Staples
- 9 – Red wire nuts
- 1 – Keyless light
- 1 – light bulb
- 1 – 4-way Switch
- 2 – 3-way Switches

Safety:

- Safety glasses
- Hard hat if in bay

Resources: N/A

Time Required: 120 minutes

EL140 4 Way Switch Lab

Procedure:

- Mount three boxes all at 45" to the top of the box if in bays. (one on each wall)
- Mount the 4/0 box in the ceiling center of the bay
- If using project board just use the 4 mounted 4S boxes provided.
- Run a 14/2 Romex to the sub panel or cord if project board
- Run 14/2 Romex to the light box from the 3rd box farthest from the power.
- Run 14/3 Romex from the power box to the empty box and then from the empty box to the box with the switch leg to the light.
- Staple per code and strip the wires in the box
- Make up of the power box (first 3-way switch)
    - Pigtail the ground wires
    - Tie off the neutral wires
- Make up the second box (4-way box)
    - Pigtail the ground wires
    - Tie off the neutral wires
- Make up the switch leg box (2nd 3-way switch)
    - Pigtail the ground wires
    - Tie off the neutral wires
- Make up the light:
    - Ground the bare copper to the green ground screw on the box.
- Install the devices:
    - Both 3-way switches
        - Terminate the ground to the green screw
        - Take the lone black wire from the 14/2 Romex and terminate it to the "common" black screw on the switch
        - Take the black and red wires and terminate them on the brass screws, does not matter which one
        - Secure the device to the box
    - 4-way switch
        - Terminate the ground to the green screw
        - Take the black and red form on 14/3 Romex and terminate them on the same colored screws, does not matter which set of colored screws you use.
        - Take the 2nd black and red wire form the same 14/3 Romex and terminate them on the remaining same colored screws.
        - Secure the device to the box
    - Keyless Light
        - Fold the ground into the far back of the box so as not to come into contact with any other wires.
        - Terminate the black wire on the bronze screw
        - Terminate the white wire on the silver screw
        - Secure the device to the box
- Power up the wires and test for accuracy. **To do this correctly**, start at the first 3-way and turn it on, then go to the 4-way and turn it off, then go to the 2nd 3-way and turn it on again, ***now follow those same steps one more time starting at the beginning*** of the first 3-way to the 4-way to the last 3-way. If the light continuously turns on and off, you have completed the lab correctly, If your light does not always turn on or off then you have a little trouble shooting to do.