



WORKSHEET 2-2

Parallel Circuits

Worksheet Objectives

In this worksheet you will assemble parallel circuits. When you have completed this worksheet, you will have demonstrated use of the DMM to measure voltage, current, and resistance in a parallel circuit.

Tools and Equipment


For this exercise you will need the following:

- Electrical simulator
- Digital multimeter

Complete the related activities outlined in each step which include:

- Assembling the circuit as shown for each worksheet section.
- Use the DMM to take voltage, amperage, and resistance measurements.
- Answer the related questions.



Stop your work when you see the  sign. You will review your work with the instructor before continuing to the next section.

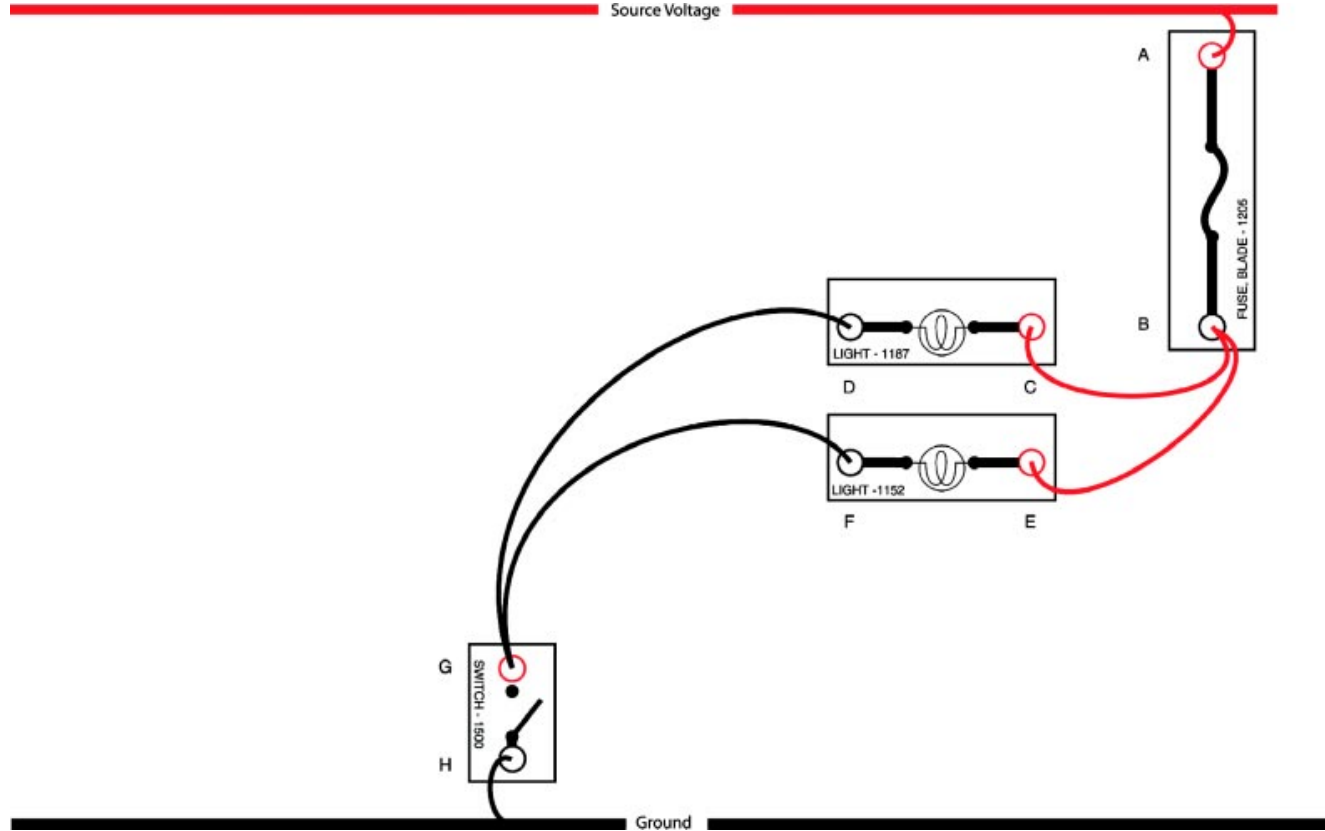
Exercise 1: Available Voltage in Parallel Circuits

Fig. 2W2-1
TL623f001c-2W2

1. Build the circuit section shown above on the electrical simulator.
2. Set up your DMM to measure the voltage in this circuit:
 - Mode selector to DC volts
 - Auto-range on
 - Black lead plugged into COM input jack
 - Red lead plugged into Volt/Ohm/Diode input jack
3. Turn on the electrical simulator power supply and close the switch (lamps should come on).

4. Predict the available voltage at the test points indicated with the circuit ON:

A. _____

B. _____

C. _____

D. _____

E. _____

F. _____

G. _____

H. _____

5. Measure available voltage using the DMM. Place the black lead on the circuit ground point. Place the red lead at each test point and note the readings in the spaces below.

A. _____

B. _____

C. _____

D. _____

E. _____

F. _____

G. _____

H. _____

Note: Ask your instructor if you are unsure why the actual voltage was different from what you predicted.

6. Measure the voltage drop in the circuit as follows: Place the red lead on the most positive side of the circuit component and the black lead on the most negative (ground) side of the circuit component (example: red lead on A, black lead on B). Measure the voltage drops through each of the circuit components:

A. Source: _____ (Measure from power supply to fuse location A.)

B. Fuse: _____

C. 1187 Lamp: _____

D. 1152 Lamp: _____

D. Switch: _____

E. Ground: _____ (Measure from switch ground point F to power supply.)

7. Measure circuit amperage at the following test points:

A. At the fuse: _____

B. At lamp 1 (branch 1 of the circuit): _____

C. At lamp 2 (branch 2 of the circuit): _____

Add the amperage of branch 1 with branch 2: _____

Does the sum of each branch equal current at the source? YES / NO (circle one)

8. Measure resistance in the circuit as follows:

A. Measure the resistance of each branch (remember to isolate the branch from the rest of the circuit by disconnecting the jumper wire at each end):

Branch 1: _____

Branch 2: _____

Add branch 1 and branch 2 together: _____

B. Reconnect the jumper wires in the circuit. Disconnect the jumper wires from the power supply.

Measure resistance from the source (A) to the ground (H): _____

Does the sum of the branches equal total resistance? YES / NO (circle one)

Why? _____



Stop here after completing all the related activities and answering the questions. Inform your instructor that you are ready to review this section.

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9. Add another 1187 bulb to the circuit as shown. Turn on the circuit.

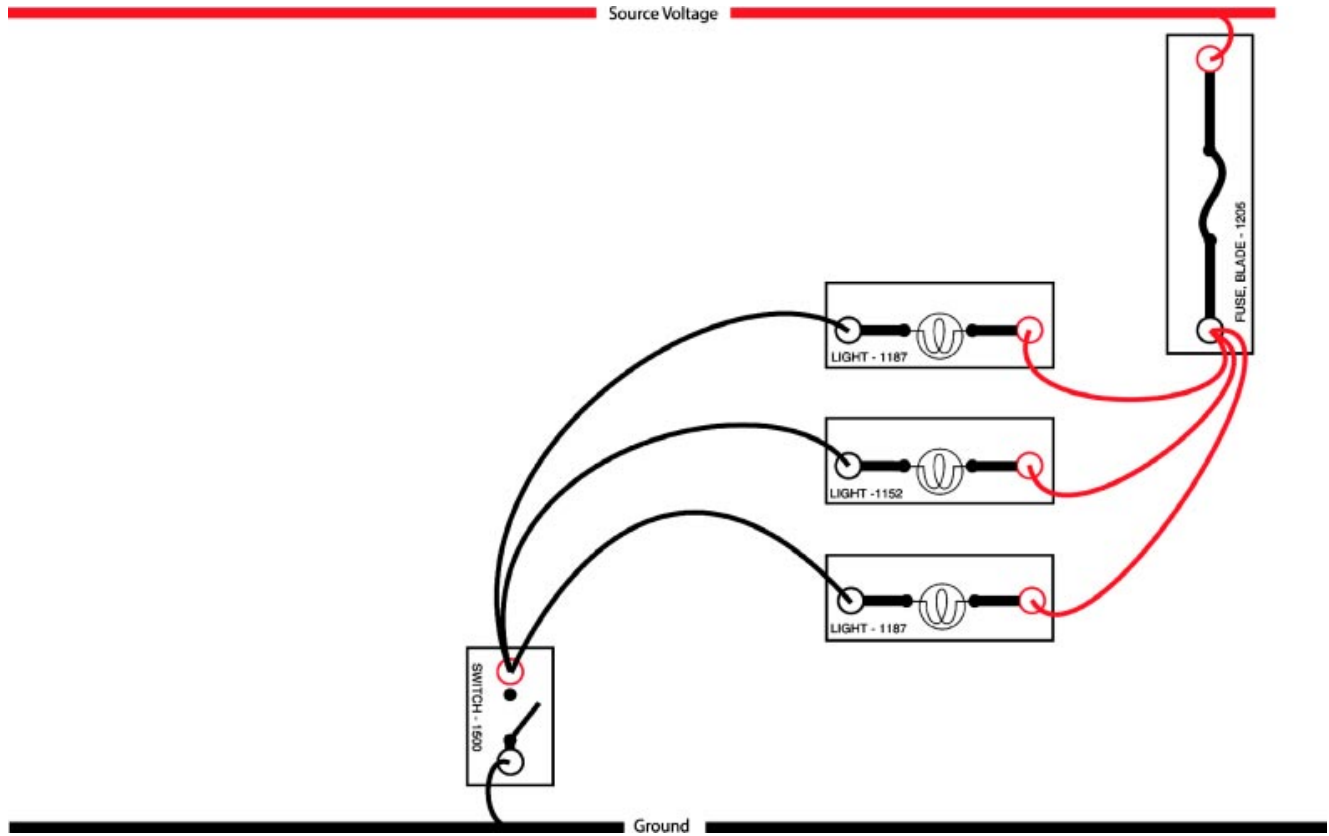


Fig. 2W2-2
TL623f002c-2W2

Did the brightness of the first lamp change? YES / NO (circle one)

If NO, explain why?

10. Measure the resistance of the circuit and of each branch (remember to isolate the circuit from the power supply):

Circuit: _____

Branch 1: _____

Branch 2: _____

Branch 3: _____

Is the circuit resistance lower than what you measured in step 8? YES / NO (circle one)

Why? _____



Stop here after completing all the related activities and answering the questions. Inform your instructor that you are ready to review this section.

11. Turn the power supply off. Add resistor 1603 (100 Ω) in the circuit as shown. Turn the power supply on.

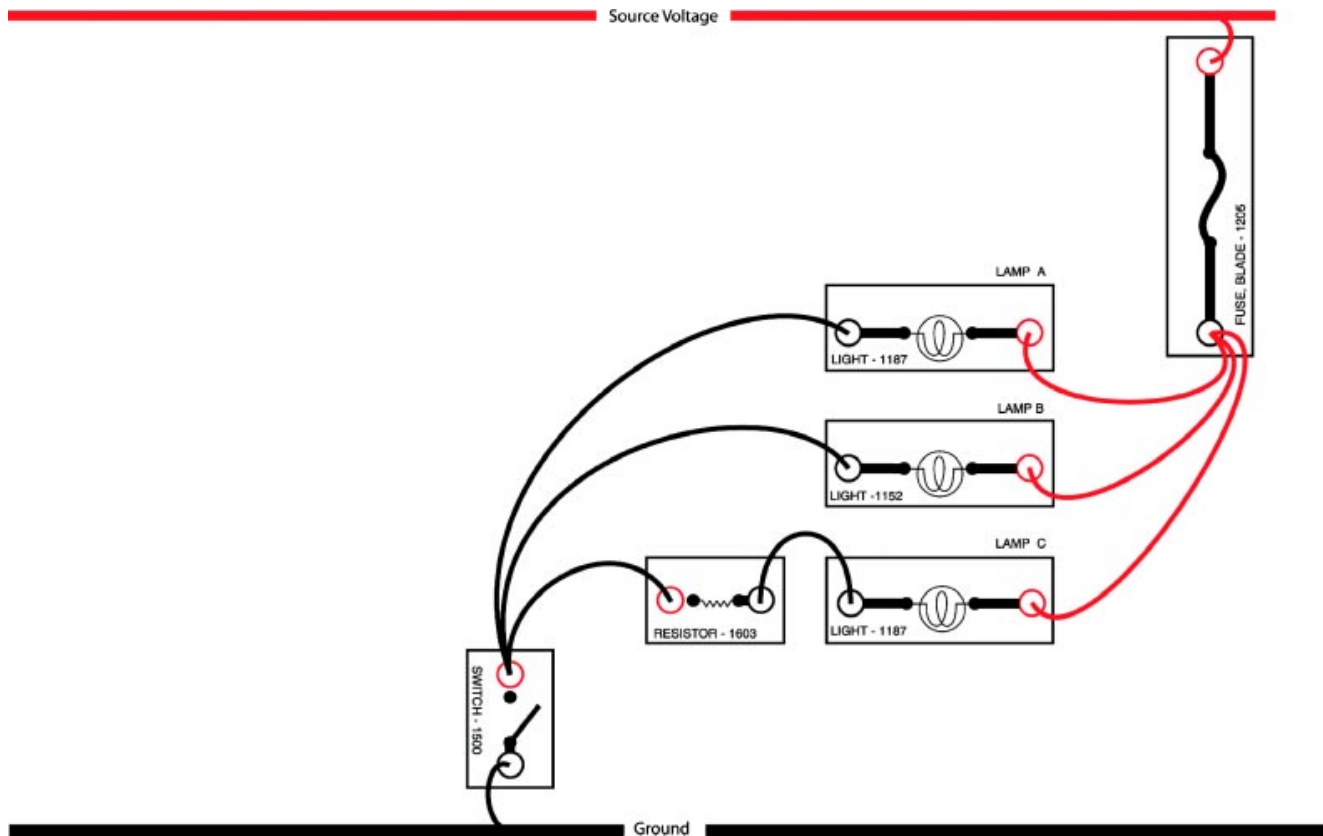


Fig. 2W2-3
TL623f003c-2W2

What do you notice about the lamps? _____

Why? _____

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12. Measure the voltage drop across each of the loads:

Lamp A: _____

Lamp B: _____

Lamp C: _____

Resistor: _____

13. Measure the amperage of the circuit at the following test points:

At fuse: _____

At branch 1: _____

At branch 2: _____

At branch 3: _____

14. Unscrew one lamp. Did they all turn off? YES / NO (circle one)

Why? _____

15. Explain the relationship between Voltage, Amperage, and Resistance based on your readings made in this worksheet.

Voltage: _____

Amperage: _____

Resistance: _____

16. Turn off the power supply and the DMM.



Stop here after completing all the related activities and answering the questions. Inform your instructor that you are ready to review this section.

Parallel Circuits

Name: _____ Date: _____

Review this sheet as you are doing the Parallel Circuits worksheet. Check each category after viewing the instructor's presentation and completing the worksheet. Ask the instructor if you have questions regarding the topics provided below. Additional space is provided under topic for you to list any other concerns that you would like your instructor to address. The comments section is provided for your personal comments, information, questions, etc.

I have questions

I know I can

Topic

Comment

Predict Available Voltage			
Measure Available Voltage			
Measure Voltage Drop			
Measure Circuit Amperage			
Measure Resistance			