



WORKSHEET 2-3

Series-Parallel Circuits

Worksheet Objectives

When you have completed this worksheet, you will be able to apply the following electrical troubleshooting techniques to series-parallel circuits:

- Predict and measure:
 - available voltage at various points in the circuit.
 - voltage drops at various points in the circuit.
- Measure amperage and resistance in the circuit.

Tools and Equipment

For this exercise you will need the following:

- Technician's Handbook
- Toyota Electrical Training Kit
- Digital multimeter (DMM)
- EWD

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: Predict Available Voltage

A series-parallel circuit is a combination of series and parallel branches in one circuit. Diagnose the series portion as a series circuit and the parallel portion as a parallel circuit.

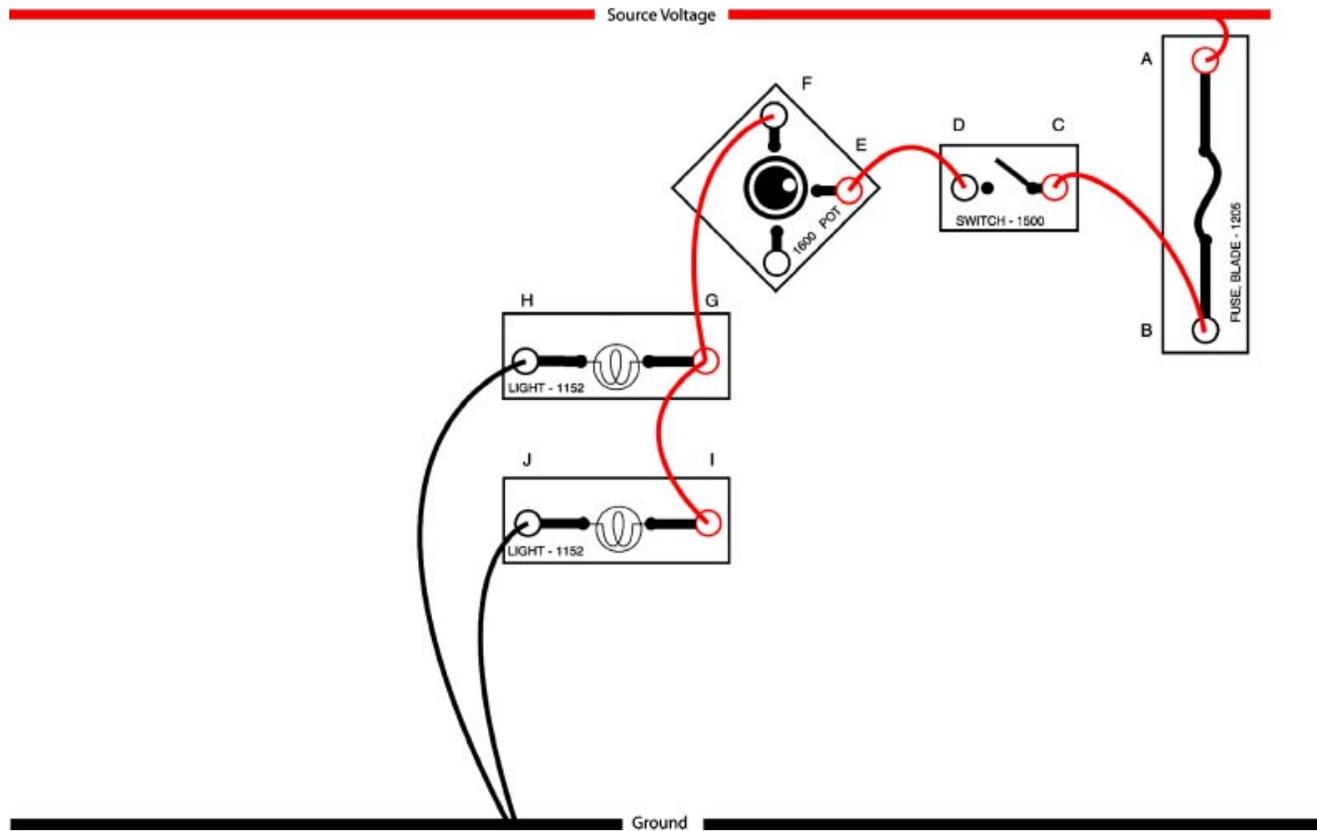


Fig. 2W3-1
TL623f001c-2W3

1. Build the circuit shown on the above electrical training kit.
 - Make sure switch is closed.

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2. Measure the available voltage with the switch closed and circuit ON.

NOTE: Measure available voltage when the bulbs are dim and at full brightness by adjusting the potentiometer.

	Bulbs Are Dim	Bulbs Are Bright
A.	_____	_____
B.	_____	_____
C.	_____	_____
D.	_____	_____
E.	_____	_____
F.	_____	_____
G.	_____	_____
H.	_____	_____
I.	_____	_____
J.	_____	_____



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

3. Predict the voltage drop at each location shown on the wiring diagram. Write the values on the diagram in the designated blank spaces and state if the test is performed with bulbs bright or dim. Measure the actual voltage drop and note the readings in the actual column.

	PREDICTED	ACTUAL
Switch	_____	_____
Potentiometer	_____	_____
Lamp 1	_____	_____
Lamp 2	_____	_____



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

4. Measure the current in the series and parallel portions of the circuit. Take three readings as follows:

- Bulbs are not lit
- Bulbs are dim
- Bulbs are bright

Take readings at the following test points:

- Series portion of circuit: Test point "E"
- Parallel portion of circuit: Test point "J"

	Bulbs Are Dim	Bulbs Are Bright
Series Current	_____	_____
Parallel Current	_____	_____



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

5. Turn the power supply off and isolate it from the circuit. Measure the resistance in the series portion of the circuit: (Note, the resistance varies so measure the minimum and maximum.)

6. Measure the resistance in the parallel section:



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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Name: _____ Date: _____

Review this sheet as you are doing the Series-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
Measure Available Voltage			
Predict Voltage Drop			
Measure Current			
Measure Resistance			



Notes