



WORKSHEET 2-9

Relays

Worksheet Objectives

When you have completed this worksheet, you will be able to:

- Determine whether relay contacts are normally open or normally closed.
- Test relays using continuity, voltage, and operational checks.
- Predict and measure available voltage at various points in a relay controlled circuit.

Tools and Equipment

For this exercise you will need the following:

- Technician's Handbook
- Electrical simulator
- Digital multimeter (DMM)

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: Relay Terminal Identification

1. Obtain relay part number 1801 from the Electrical Simulator.
2. Refer to the connector illustration below to identify the relay coil and contact terminals of the relay.
3. Use a DMM to check continuity between the two sets of relay terminals (relay coil and relay contact).
4. Use the results to fill in the table below:

Relay Coil		Relay Contacts	
Terminal #'s		Terminal #'s	
Continuity		Continuity	
YES	NO	YES	NO

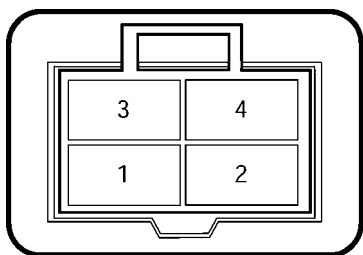


Fig. 2W9-1
TL623f001-2W9

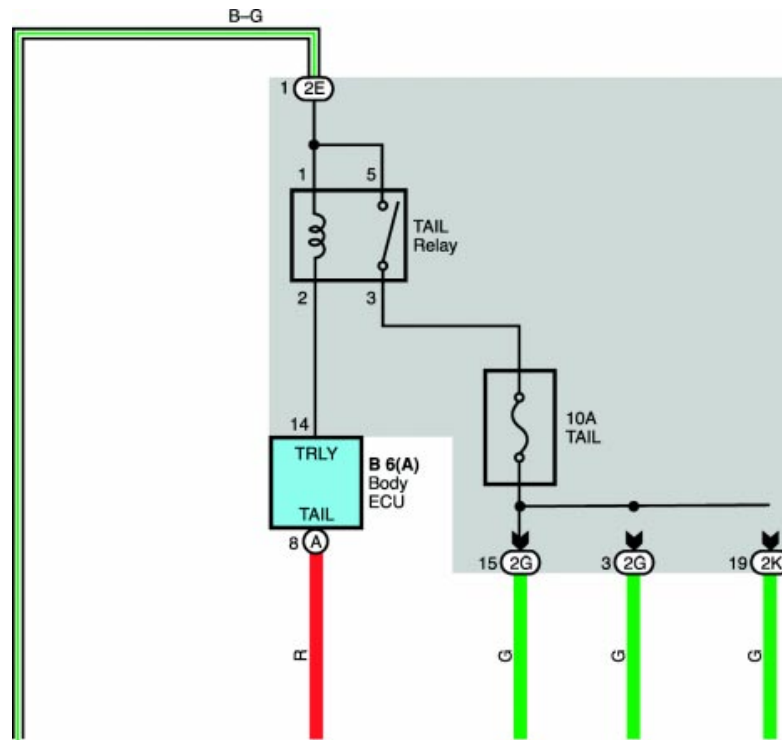


Fig. 2W9-2
TL623f002c-2W9

Exercise 2: Relay-Controlled Circuit

1. Refer to the wiring diagram above. Are the relay contacts normally open (NO) or normally closed (NC)? Indicate your answer with a check mark below:

NO _____ NC _____

2. Build the relay-controlled circuit on the electrical training kit (functionally identical to the circuit shown in Figure 2W9-3).

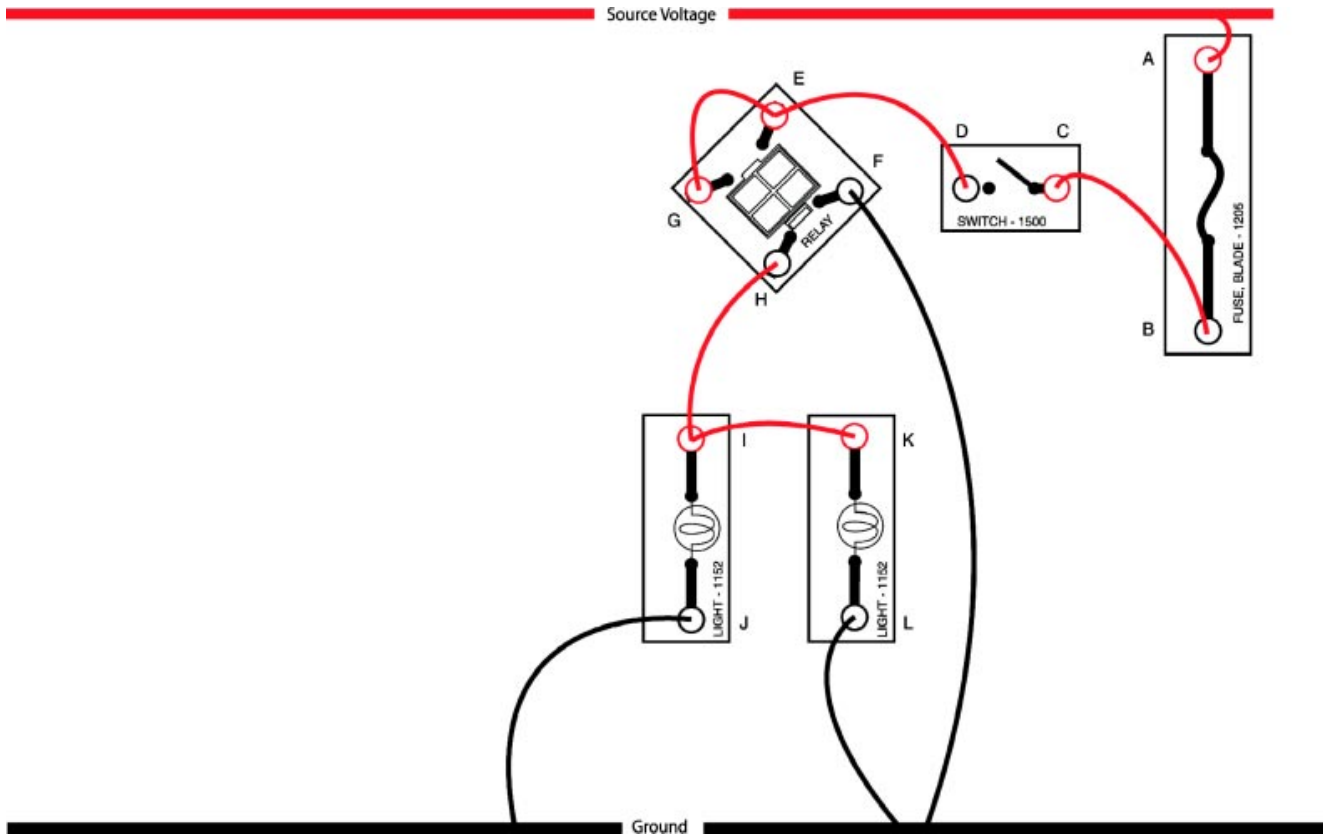


Fig. 2W9-3
TL623f003c-2W9

3. What will happen when you close the switch?
- _____
4. Switch the power supply on.
5. Listen closely to the relay as you close the switch. Does the relay click?
- YES / NO (circle one)
6. Does hearing the click confirm that the relay is operating correctly?
- _____
7. Why do the lamps go on when you close the switch?
- _____

Relays

8. Measure the current flowing through the relay coil (insert the DMM into the circuit at point "F"). Record the measurement in the blank space below (remember to specify the correct units, amps or milliamps):

9. Measure the current flowing through the lamps (insert the DMM into the circuit at point "H"). Record the measurement in the blank space below:

10. Which path (through the relay coil or through the lamps) conducts more current?



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

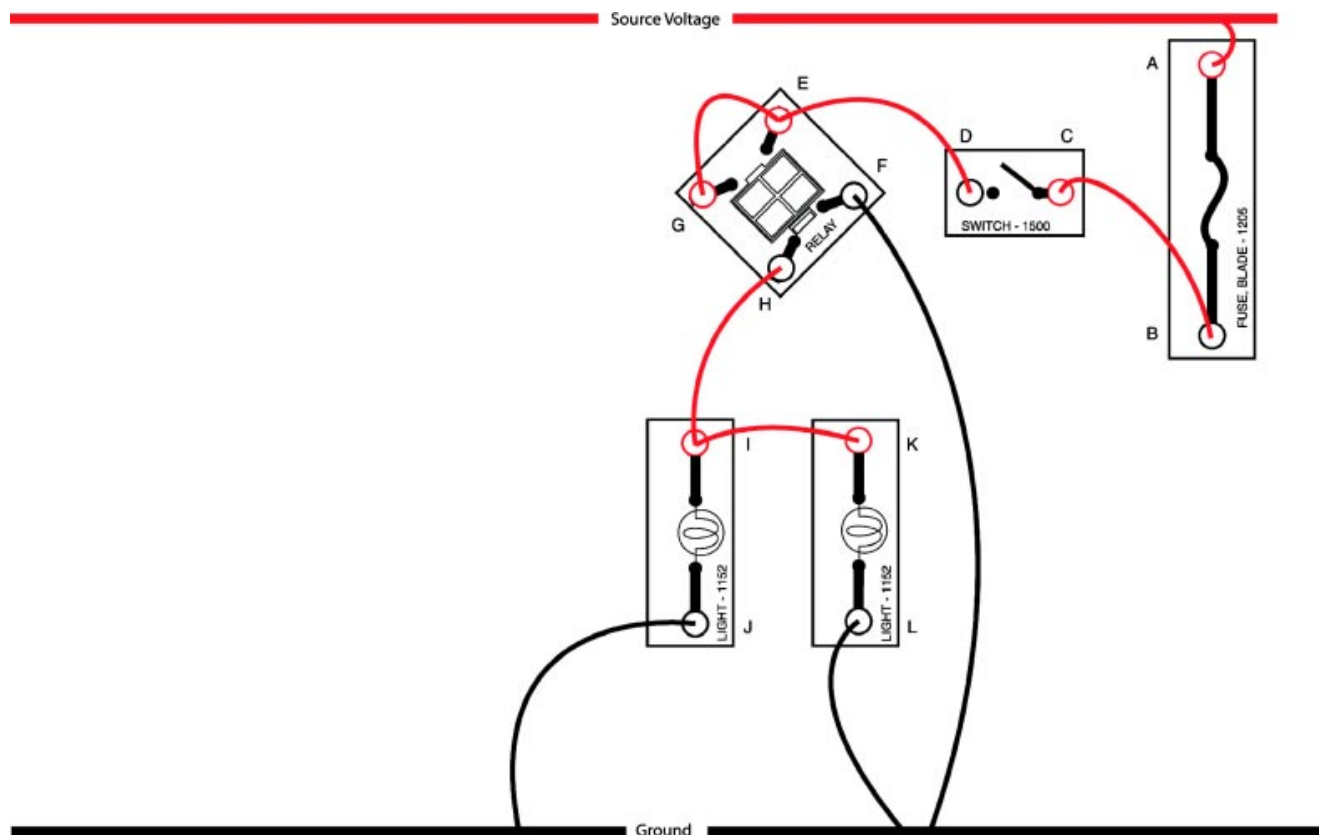


Fig. 2W9-4
TL623f003c-2W9

Exercise 3: Voltage Tests

- Predict the available voltage at each numbered test point in the circuit. Make your predictions for the circuit as it is shown (power applied from the battery, switch closed, relay energized). Record your predictions below.

	PREDICTED	ACTUAL
A.	_____	_____
B.	_____	_____
C.	_____	_____
D.	_____	_____
E.	_____	_____
F.	_____	_____
G.	_____	_____

	PREDICTED	ACTUAL
H.	_____	_____
I.	_____	_____
J.	_____	_____
K.	_____	_____
L.	_____	_____

2. Connect the black lead of the DMM to the electrical training kit ground. Touch the red lead to each test point and record the actual results above.



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

Disassemble the circuit and return all components into the electrical simulator storage case. Turn off the DMM (you will use the DMM in other worksheets so you do not need to store it at this time).

Relays

Name: _____ Date: _____

Review this sheet as you are doing the Relays 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 you instructor to address. The comments section is provided for your personal comments, information, questions, etc.

I have questions

I know I can

Topic

Comment

Check Continuity			
Determine if Relay is Normally Open (NO) or Normally Closed (NC)			
Measure Current Flow			
Predict Available Voltage			
Measure Available Voltage			