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| Station | | Task | |
| 26 | | 2 | |
| ELECTRIC TESTS | | | |
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# Parallel circuit / Overload

## TASK OBJECTIVE

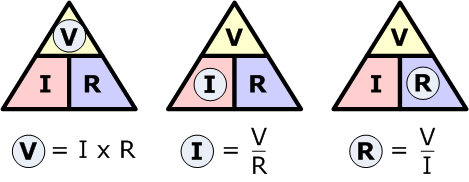
At the completion of this task the technician will be able to understand the differences between circuits in series and circuits in parallel and how the current is affected.

At the same time, the technician will be able to identify the difference in blown fuses, to determine if the malfunction is a direct short circuit or an overloaded circuit.

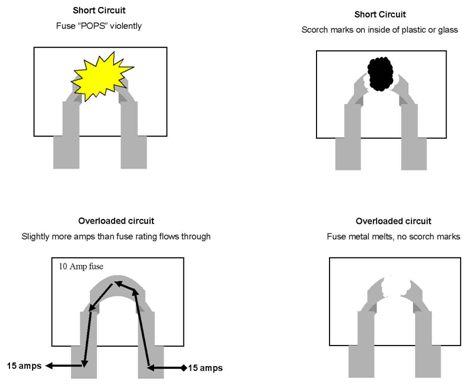
**PARALLEL CIRCUIT**

Simply stated, a parallel circuit is one that consists of two or more load devices, each with its own path for current flow so when one of the loads is burn out, removed or switched off, current would continue to flow to and through the others.

When more resistors are added (in parallel) to a parallel circuit, unlike the circuit in series, the circuit’s resistance decreases; and according to Ohm’s Law, as resistance decreases, amperage (current flow increases)



**FUSE DIAGNOSIS**

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**PROCEDURES**

Follow the steps and answer the questions below:

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| 1. The circuit 2 is a circuit with his resistances connected in series |
| 1. Place the AMP clamp at I |
| 1. Switch #1 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Switch #2 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Switch #3 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Switch #4 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Switch #5 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Is the current increasing or decreasing? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Switch OFF all the switches |
| 1. Place the Amp clamp at K |
| 1. Switch #6 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Switch #7 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Switch #8 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Switch #9 ON and note the amps:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. What has happened?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. What was the amperage before the fuse blown off?\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Find the blown fuse using the voltage drop test |
| 1. What should the voltmeter show on the good ones?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. What should the voltmeter show on the blown ones?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. Remember the cable A-B |
| 1. What can you detect on a fuse using the voltage drop test that can’t detect a volt reading or a test light?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 1. What is the amperage of the blown fuse? |
| 1. Keep the fuse for later |
| 1. Switch on #18 |
| 1. Is the light lighting? |
| 1. Switch #14 to the right |
| 1. What happened? |
| 1. Locate the fuse using the voltage drop test |
| 1. Remove the fuse and inspect both with the help of the magnifying glass |
| 1. What is the difference between them? |
| 1. Which one is shorted? 3 amps 10 amps |
| 1. Which one is overloaded? 3 amps 10 amps |
| 1. Switch #14 to the left |
| 1. Switch off all switches and install a new 3 amps fuse **(don’t replace the 10 amps fuse yet)** |

**QUESTIONS**

1. What have you learned from this task?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2. Which of the following reasons can overload a fuse?

Wrong fuse for the specific load

Load added in parallel

Load added in series

Increase of the mechanical resistance of the actuator

Decrease of the internal resistance of the actuator

Voltage increase

Another fuse in series

Another fuse in parallel

**Instructor sign off-- Go \_\_\_\_\_\_\_\_\_\_**