

Ground Circuits

Ground circuits are one of the most important aspects when engaging an electrical circuit, especially a high voltage electrical circuit. The primary reason for establishing quality ground circuits is safety! The ancillary reasons are more electrical in nature. Establishing a ground (return) circuit is necessary for an electrical circuit to function properly. Lastly, quality ground circuits are necessary to reduce ground potential differences that can cause electrical currents to flow in other areas of the vehicle (ground loops). Ground paths can also be developed across parts of the human body by placing it in series with both the positive and ground circuits. An example can be viewed in Figure 1-6 in which ground paths are developed from hand-to-hand or finger-to-finger that can cause damage by permitting electrical current to flow from the negative side of circuit (ground) through the body (hand-to-hand) or in the hand (finger-to-finger) and back to the positive side of circuit. Either condition could cause devastating electric shock results depending on body resistance and voltage level.

The human body can also be damaged when a person places themselves in series with the ground path. For example, if a person were to place one hand on earth ground and the other to a high voltage positive connection of a circuit, their body would be placed electrically in the high voltage circuit. This could also be said if a person were to place a hand on a chassis of a hybrid, electric or fuel cell vehicle. In this case, if high voltage is leaking to the chassis of the vehicle and a person was to contact a high voltage positive connection, their body would be electrically placed in the high voltage circuit. In either case, the result could be a devastating electric shock result depending on body resistance and voltage level. Figure 1-7 provides an illustration of an earth (or chassis) ground path with either a hand-to-hand or finger-to-finger connection between the positive or ground circuits.

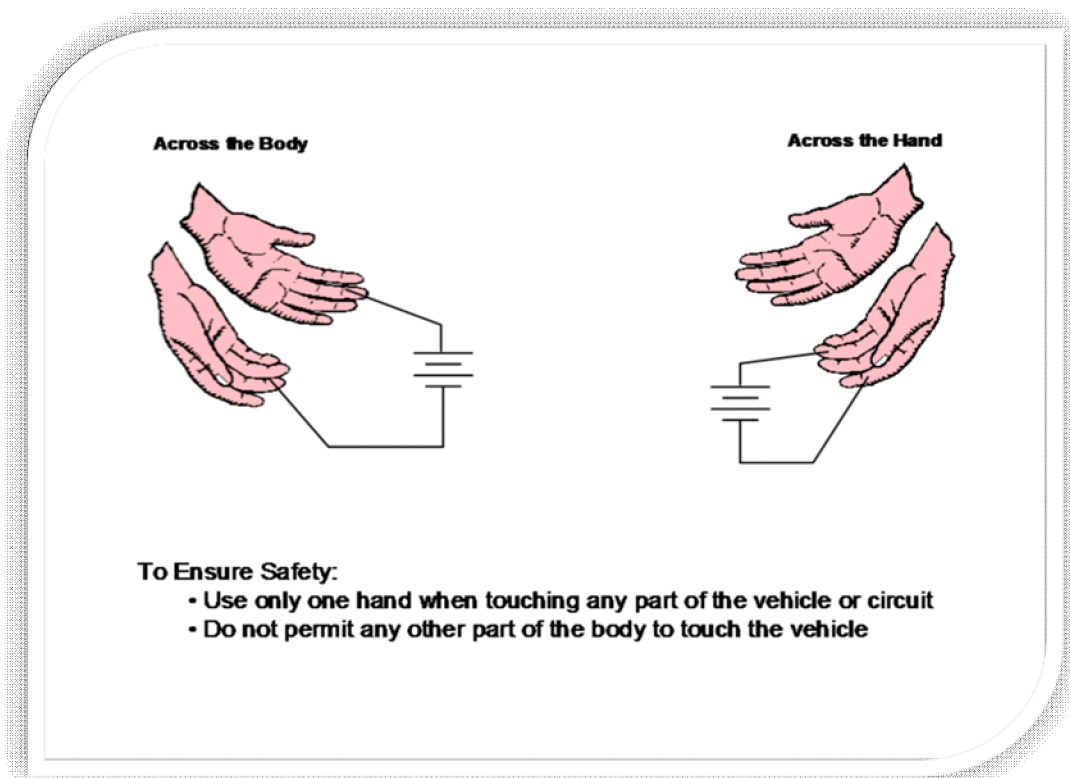


Figure 1-6. Ground paths directly across hands and fingers

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