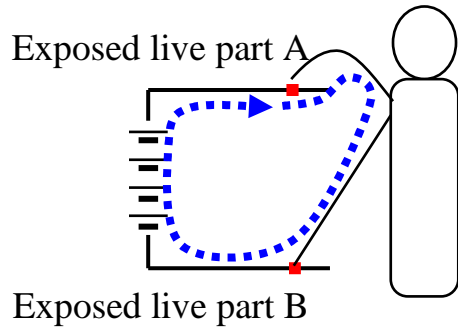


EVPC-2-5

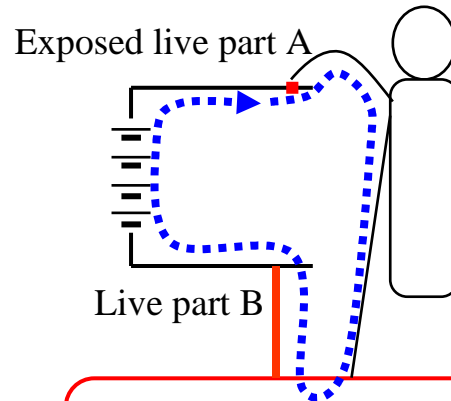
# Safety Requirement in Attachment 111 JASIC

# 1. Electric Shock Pattern



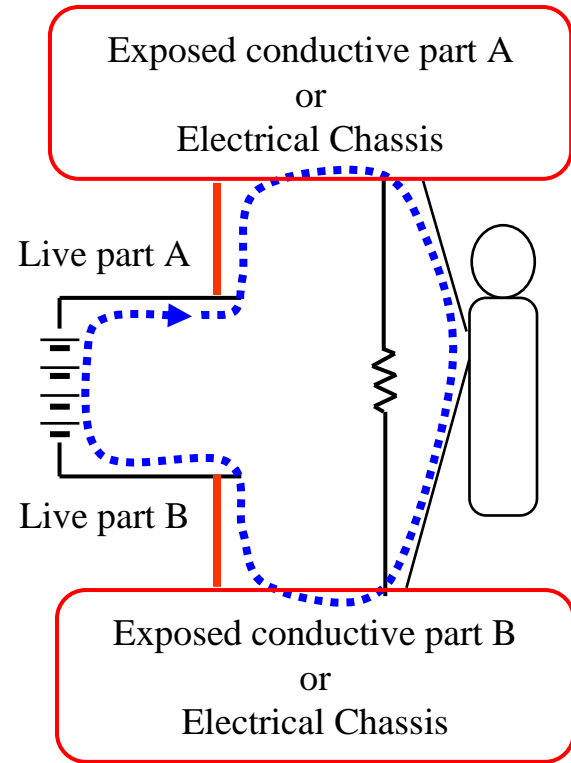
CASE 1

Contact to **2** exposed live parts



CASE 2

Contact with exposed live part **and** insulation loosen exposed conductive part



CASE 3

Contact with **2** insulation loosen exposed conductive parts which are not potential equalized

Note: Exposed conductive part : Conductive part which can readily be touched and which is not normally alive, but which may become electrically energized under fault conditions.

**Only when a person touches two of live parts, insulation lost exposed parts or electrical chassis whose electrical potential is different, it is hazardous.**

## 2. Protection Method





○ : No hazard possibility  
 ✗ : Hazardous

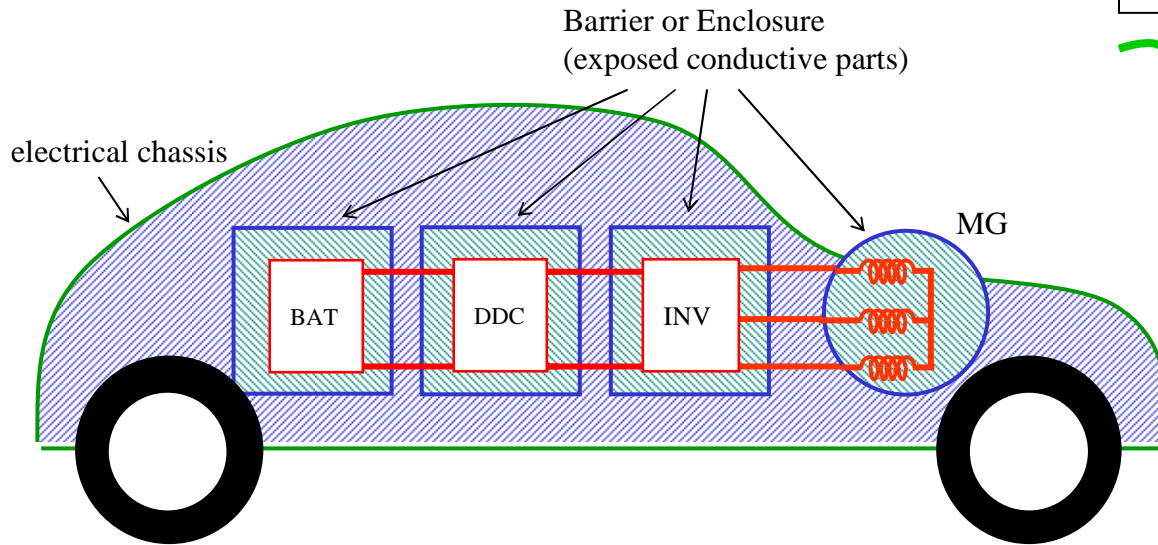
Protection Method	(A) Protection against Direct Contact	(B) Protection against Indirect Contact	(C) Insulation Resistance	(D) Low Voltage	(E) Low Energy
Case 1					
Case 2	 Exposed Conductive Parts	 Exposed Conductive Parts	 Exposed Conductive Parts	 Exposed Conductive Parts	 Exposed Conductive Parts
Case 3	 Exposed Conductive Parts	 Exposed Conductive Parts	 Exposed Conductive Parts	 Exposed Conductive Parts	 Exposed Conductive Parts

**Protection against Electrical Shock**

- Combination of (A) and (B)
- Combination of (A) and (C)
- (D)
- (E)

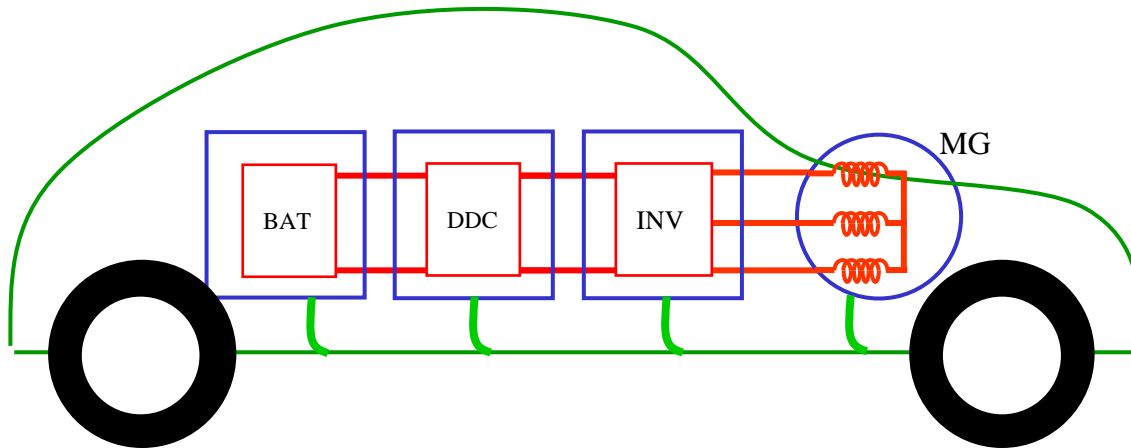
### 3. Concept of Physical Barrier Protection

-  or  : Insulated
-  : Not Insulated
-  : Potential Equalization



#### Basic Idea of FMVSS 305

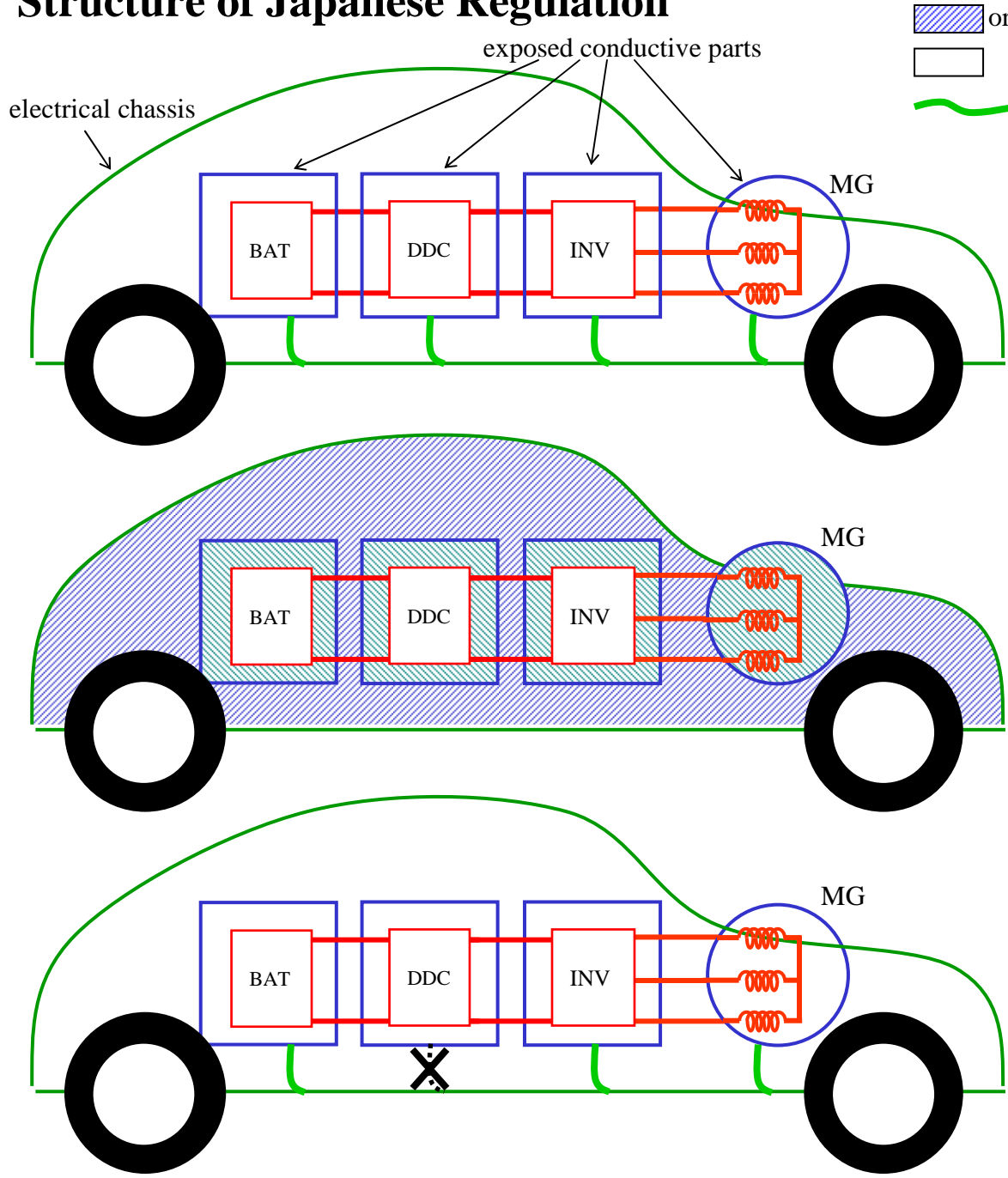
If the high voltage buses are isolated from the electrical chassis (and the exposed electroconductive barriers and enclosures), it is not electrical hazardous even if a human directly touches one high voltage bus.



#### Concept of physical barrier option

If a human cannot directly touch the high voltage buses, it is not electrical hazardous even if the isolation resistance cannot be maintained provided the exposed electroconductive barriers and enclosures are potentially equalized..

# 4. Structure of Japanese Regulation

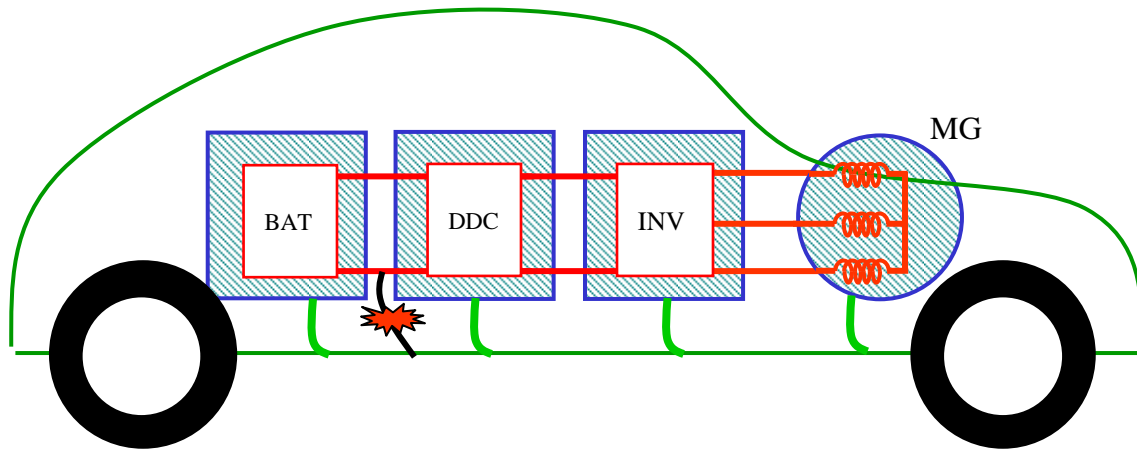


or  : Insulated  
 : Not Insulated  
 : Potential Equalization

1-3-2  
 The resistance between all exposed conductive parts and the electrical chassis shall be lower than 0.1 ohm when there is current flow of at least 0.2 amperes.

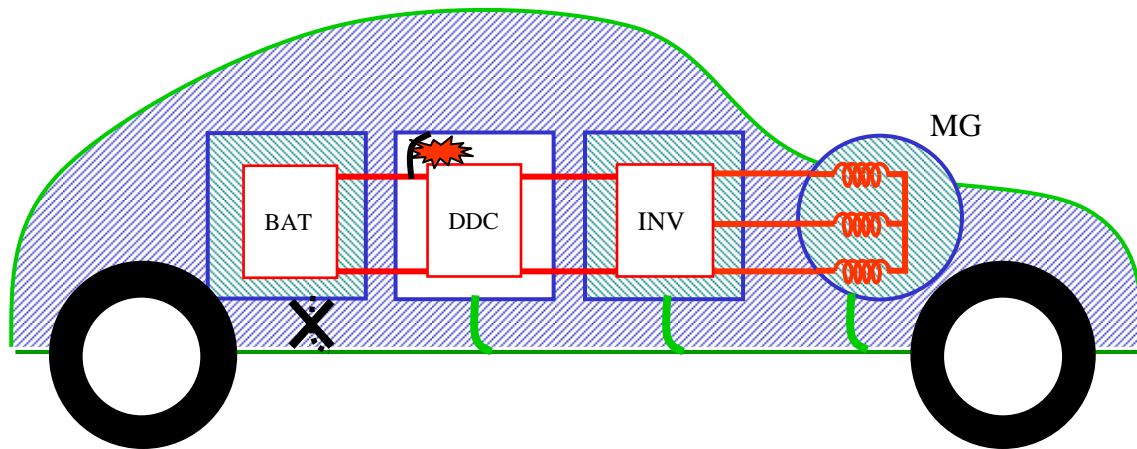
1-3-3  
 Insulation resistance between the live parts and the electrical chassis shall have a minimum of 100 ohms per volt of the working voltage.

1-3-4  
 When there are exposed conductive parts that can be touched from the passenger compartment which do not satisfy the requirement of Paragraph 1-3-2, exposed conductive parts or electric chassis those which do not satisfy the requirements of Paragraph 1-3-3 shall be one position or none.



1-3-5

When the insulation resistance between live parts of the power train and the exposed conductive parts that can be touched from the passenger compartment do not satisfy the requirements of Paragraph 1-3-3 and when the insulation resistance between live parts of the power train and the electric chassis do not satisfy the requirements of Paragraph 1-3-3, the said exposed conductive parts shall satisfy the requirements of Paragraph 1-3-2.



1-3-6

When the insulation resistance between live parts of the power train and the exposed conductive parts that can be touched from the passenger compartment do not satisfy the requirements of Paragraph 1-3-3 and the insulation resistance between live parts of the power train and the electric chassis satisfies the requirements of Paragraph 1-3-3, exposed conductive parts which doesn't satisfy the requirements of Paragraph 1-3-2 shall be one or none.

**\* Direct contact to the live parts must be avoided in any case.**