

TECHNICAL PAPER

JASO TP-09001
GUIDELINES CONCERNING ELECTRICAL RELIABILITY OF
42 V ELECTRICAL CONNECTORS FOR AUTOMOBILES**1. Aim**

The aim of this technical paper is to specify the guidelines for maintaining connection reliability by giving careful consideration in design to preventing electrical leakage or arc between terminals in 42 V connectors of vehicles installed with a 42 V system.

2. Design guidelines for 42 V connectors**2.1. Design considerations to prevent electrical leakage**

As a measure against electrical leakage in 42 V connectors, a sufficiently larger creepage distance between terminals shall be ensured in comparison to 14 V connectors. (See Section 3.1. for a supplementary explanation.)

2.2. Design considerations to prevent arc

As a measure against arc in 42 V connectors, a means of preventing loose connector fitting shall be added to the connector structure (for example, a means of detecting loose fitting such as connector position assurance). (See Section 3.2. for a supplementary explanation.)

SUPPLEMENTARY EXPLANATION FOR GUIDELINES CONCERNING ELECTRICAL RELIABILITY OF 42 V ELECTRICAL CONNECTORS FOR AUTOMOBILES

1. Purpose of establishment

In the case of a vehicle installed with a 42 V system, designers have to understand the necessary requirements for connectors used in 42 V circuits and take sufficient consideration of these requirements in the design. This technical paper describes the basic concept and methods for measures against electrical leakage and arc, which require special consideration with 42 V connectors.

2. Aim (Section 1. in the main text)

The following are likely risks for connectors due to the higher voltage vehicle power supply (i.e., the adoption of a 42 V power supply instead of a 14 V power supply).

- Melting damage to the terminals and housing due to electrical leakage caused by water entry or the like.
- Melting damage to the terminals due to arc generated when the connector fitting is loose (i.e., when chattering occurs between terminals due to vibration) or when the connector is disengaged while the line is live (i.e., when voltage or current is applied).

In order to avoid the above issues, design guidelines are required for connectors compatible with 42 V circuits to maintain the connection reliability of the connectors (see **Figure 1**).

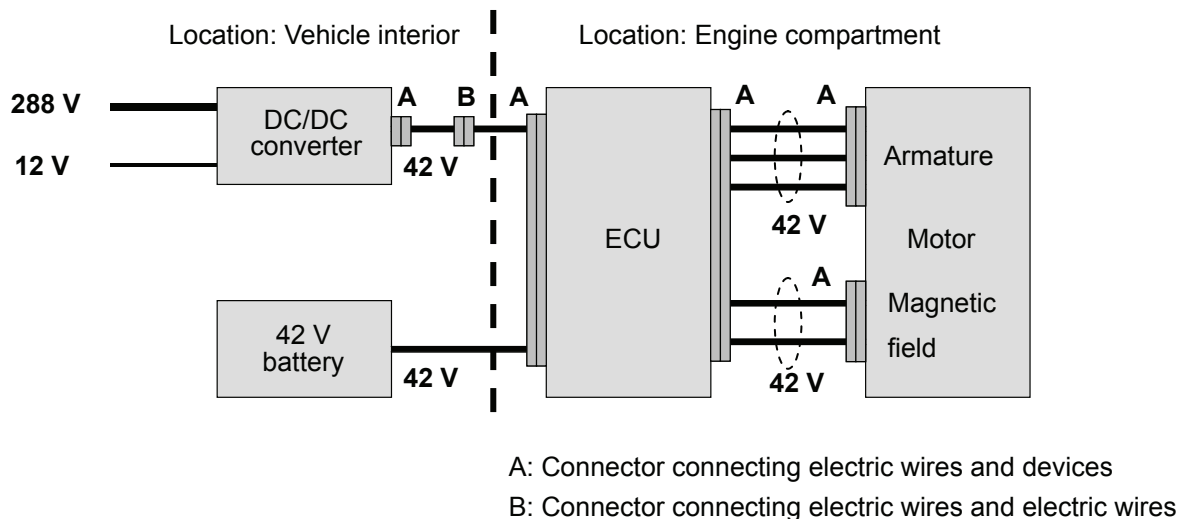


Figure 1 Example of connectors in use

3. Design guidelines for 42 V connectors (Section 2. in the main text)

It is preferable that a 42 V connector should maintain an electrical leak resistance performance equivalent to that of a 14 V connector. Arc may occur when the basic connection function of a connector is adversely affected when, for example, the connector fitting is loose or the connector is disengaged while the line is live. However, at present, there are no guidelines regarding arc resistance performance for connectors. Current implementation includes systematic measures to prevent connector disengagement while the line is live and structural measures in the connector to prevent loose fitting. The next section shows examples of measures against electrical leakage and arc in a 42 V connector.